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BY

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Professor Whipple reviews life work of PROFESSOR SEDGWICK

FIFTIETH ANNUAL MEETING, A. H. P. A. NOVEMBER 14-18, 1921, NEW YORK CITY

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Vol. XI APRIL, 1921 No. 4

IMPORTANCE OF ORAL HYGIENE DURING CHILDHOOD

HARRY B. BUTLER, D. D. S.,
Director of Mouth Hygiene Unit No. 1, U. S. P. H. S.,
Washington, D. C.

Read before Session on Child Hygiene, American Public Health Association, at San Francisco, Cal., September 16, 1920.

Civilization is robbing the human race of its teeth and toothless man seems not far distant. The possibility of education to a coarser diet appears to be most remote, so the most hopeful coarse lies in prophylactic measures. The field is the child and the woman Dental Hygienist is the most promising missionary of preventive dentistry.

BEFORE taking up the field investigations in mouth hygiene under the Child Hygiene Section of the United States Public Health Service, the writer, realizing that the work would be principally among children, took advantage of the opportunity to examine several hundreds of children's skulls found in the National Museum. The skulls would average 200 to 300 years old. The field from which they had been collected ranged from the Aleutian Islands, down our Pacific coast, through Honduras and Yucatan, into Peru and across to the South Sea Islands. It was astonishing to discover among this entire collection but a single tooth which showed dental caries.

The investigations carried on during the last year show findings which, compared with the above, become alarming. Out of 7,059 children examined in the State of West Virginia some 16,151 cavities were found exclusive of those containing fillings. Another surprising item was that of underdeveloped jaws and irregular teeth, there being 1,759 of these cases out of 5,935 examined. None of these cases were found in the examination of the skulls referred to.

Among the interesting points of information gained by this study is that the teeth of the Eskimo, due to the hard usage given them, are in a process of evolution, becoming larger and more firmly set in the bony structures supporting them. In some instances this amounted to the formation of actual buttresses about the roots of these teeth.

The conclusion to be drawn bears out the statement of one scientist, that it is but a matter of few generations before civilized man will be edentulous or without teeth. The possibility of persuading the people of today to subsist upon a

coarser diet is most remote and it will be at once seen that our only hope in this direction lies in some prophylactic measure.

A point of great interest is noted in the case of children who show retardation or are under weight. Particularly interesting is a group of 33 retarded children brought for examination. Among these 29 were found to have malocclusion of varying degree and 28 had some pathological gum condition. The examination of 270 underweight children showed 33 percent of them to have from one to four cavities, 46 percent to have from four to eight cavities and a number showed nine, ten and eleven. A marked relation between dental defects and ill health cannot be denied.

Much valuable information may be gained by the study of the reports of the draft boards during the recent war. The greatest number of rejections for any one cause was that for defective vision and the second greatest was for dental defects and it must be here stated that the requirements in this particular were not stringent. Thus again is shown the fact that the conditions existing in the country today are more serious than generally considered and we can but be impressed with the necessity of adopting some definite preventive measures in the immediate future.

Already in England there is under way a program tending toward the improvement of dental conditions for all the people[1] and the most recent country to adopt measures of national magnitude in this line is New Zealand. A letter from the consul general at Aukland states that there has been appointed a national director of mouth hygiene, with a competent corps of assistants who will, at government expense, care for the teeth of all the school children. New York state has a state bureau of mouth hygiene. Among the later states to adopt similar measures is Tennessee, and West Virginia has a similar movement well under way.

The greatest step in this direction is found in America, where we have the dental hygienist, a woman specialist who confines her activities to preventive measures and who exceeds in skill in this particular, the dental man. The dental hygienist solves more than one of our greatest problems for us. There has always been an almost instinctive fear of the dental chair upon the part of children and in overcoming this fear the hygienist serves us well. She has an instinct which enables her to get on well with these little ones and is as far ahead of the average dental man in this particular as is the trained nurse ahead of the male nurse, and for the very same reasons.

A very serious problem confronts us in the matter of the first or six year molar. Out of 7,059 examinations some 1,822 of these teeth were found to be missing and it must be borne in mind that some of these had been erupted but a very short time. These teeth seem to have been lost for one of two reasons; either because of the fear which the child had, or else the parent has failed to recognize this tooth as a permanent tooth. In her work among the school children the hygienist solves this problem in either case. The dental hygienist is the real foundation upon which we must build the structure of preventive dentistry, and some 12 states, realizing this, have enacted legislation which legalizes the practice of dental prophylaxis by these women.

As stated before, our only hope of reducing dental caries lies in some prophylactic measure. The question at once arises, can satisfactory results be obtained by this means? In Bridgeport, Conn., this work has been in progress for a period of five years and the records show a reduction in caries of over 50%.

Dr. Fones, in whose charge this work has been carried on,[2] states that in his opinion this can be further reduced to at least 70 or 80%.

It has never seemed to the writer, however, that the main objective of mouth

hygiene was the prevention of dental caries. It is a health measure rather than a dental measure. In communities where rational mouth hygiene has been accepted and put into practice there has been reported a reduction in the percentage of cases of illness among school children that seems at first glance to be beyond possibility. In the work at Bridgeport we find that diphtheria has been reduced from 36.6% to 18.7%, measles from 20% to 4.1%, and scarlet fever from 14.1% to 0.5%. Similar results appear wherever careful records have been kept.

Recently the matter of focal infection as related to the mouth has been given much prominence due to the advent of the X-ray. It is not to be denied that abcesses at the apices of roots constitute a constant menace to general health. Before an individual can show symptoms of most of the diseases of which we have definite knowledge, it is necessary that bacteria, or their products, enter the blood stream. This takes place in the areas surrounding the apex of a tooth root which becomes infected from the putrescent pulp of a tooth, but an equally if not more dangerous source of infection is the area surrounding the neck of the tooth, at the border of the gums. It does not require a radiograph to reveal this, but the fascination of radiography has called attention to the apex of the root and in a measure obscured our vision of gingival lesions.

If any of these abscesses* or ulcers existed in any other part of the body or in any other part of the digestive tract, serious results would be anticipated. Then why tolerate them in the body's main gateway? It is at least inconsistent to demand pure water and pure food and to then pollute them at the moment of their being taken into the digestive tract!

Were our sustenance taken into the body through an orifice in the chest wall direct, this orifice would be kept carefully covered and not the slightest sepsis would for one moment be tolerated there. The location of the mouth and its varied functions in no way lessens the inconsistency of demanding pure food and allowing the mouth to contain chronic ulcers, pus and decomposed filth. Yet this is revealed every time a group of children is examined and for the greater part it has been allowed to go unnoticed.

The improvement in mentality and in school work that always follows the introduction of a system of mouth hygiene into a school system is so marked that it is difficult to get the average thinking man to believe the very result that he sees. In Bridgeport retardation cost the city 47% of the entire budget. This was reduced to 17%, meaning a reduction of 30% in the housing required, 30% less teachers, a reduction of 30% in the entire school budget.

At Trenton, N. J., there is a state hospital for the insane. The superintendent, Dr. Henry A. Cotton, claims to be discharging 70% of those admitted to his institution through means of cleaning up mouth sepsis and its sequellæ, the infected tonsil and the gastro-intestinal ulcer. This work is not new to Dr. Cotton; he has been doing it for a period of ten years. The bacteria found in the mouth, or their products, selecting the brain as their field of activity, become the direct cause of abnormal mentality. Toxins must be regarded as vegetable poisons, as is alcohol, and it should not be hard to realize that some of these affect the brain as does alcohol. Psychiatrists have long recognized a type of insanity referred to as the toxic cases.

Much adverse criticism has appeared in relation to Dr. Cotton's claims. One point frequently noted is that many cases of *dementia præcox* and of the maniac-depressive type clear up and are discharged without having received treatment along the lines mentioned. It would seem that this but strengthened, rather than refuted, Dr. Cotton's claims. These patients, given a period of pro-

*The paper was illustrated by a number of beautiful illustrations in color of actual cases, which it is not practicable to present here.

longed rest and furnished with a well-balanced diet, have their resistance raised and overcome the bacteria by their own vitality. But the fact that the discharges of recovered patients at Trenton continues cannot be denied.[3]

A definition of insanity which meets all tests[4] is "The inability of an individual to accommodate himself to his circumstances." Now if the bacteria of the mouth, or their toxins, will cause an adult so to conduct himself as to be legally adjudged insane and committed to an institution for these unfortunates, is it surprising that these same organisms in a child, whose susceptibility is much greater, should cause him so to conduct himself that he fails to harmonize with his teacher and the general plan of school work?

It is not claimed for a moment that all the bacteria found in the mouth are brain selective as far as their toxic effects are concerned, but it is true of some at times. Again they may form the bacterial overload which results in mental unbalance in borderline cases. They may exist as harmless saprophytes in a normal mouth, but given the media of food debris or of blood serum from abnormal gums upon which to grow and they at once assume entirely different characteristics.

W. H. Burnham states,[5] "Educators are beginning to realize that the knowledge acquired in the schools amounts to little, but that the habits formed and the attitude formed toward life, society and the work, are of vital importance. Most important of all, perhaps, is the problem of obtaining the right attitude between pupil and teacher." We cannot expect this attitude to be formed if the child is suffering from even a slight degree of auto-intoxication from his oral condition.

Psychologists agree[6] that the future of an individual depends very largely upon his life during his pre-school age, and that the future of a child can be successfully predicted by observing him during his sixth year. During this early period of life there occurs a fixation of mental trends that largely determines the attitude toward life as a whole. Is it possible that the best attitude can be formed unless the child be in the best of health? The benefits of all hygienic measures at this period of life are more necessary than at any other period.

Little attention is given to the mouths of these little ones on the assumption that, since the deciduous teeth will be replaced by the permanent set, no particular attention to them is necessary, and in this the average dentist is the chief offender. Putrescent pulps, abcesses and endless colonies of pathological organisms are allowed to remain and the responsibility is thrown upon nature. Modern dentistry is more deficient along this line than any other. The normal absorption of roots takes place only when the physiological integrity of the pulp is preserved, and the life of the pulp is essential to normal dentition.[7] Much of the malocclusion in the adult is traceable to the death of the pulp in a deciduous tooth.

Medicine and dentistry have long been practiced as separate professions. The medical man has left the mouth entirely to the dentist and the dentist has worked along mechanical lines to the exclusion of pathology, and in this both professions are at fault. The greatest benefit of the X-ray to mankind is the closer relationship of the medical and dental men. The problem of caring for the mouths of the little ones is an exceedingly important one and it must be met, faced and solved by the best efforts of both medicine and dentistry.

Just as in preventive medicine lies the greatest good in all medical science, so, too, in dental prophylaxis is to be found the nearest solution of this problem. The establishment of a dental clinic in a school and the employment of competent persons to care for the mouths of the younger children comes nearest to the requirements.

Among the other important measures that may be instituted is the toothbrush

drill. This feature of mouth hygiene must not be underestimated in its value. All will admit the difficulty of getting the average child habitually to brush his or her teeth. But in children we find herd instinct to be very strong. As soon as the first boy appears at school in the springtime with his marbles, all sewing, cooking and other domestic activities in the homes of the other boys must cease until the last year's marbles are located. Children will give various amusing excuses to avoid the brushing of their teeth. However, given the idea that it is a perfectly proper procedure and one practiced by the other children, the acceptance of the mouth toilet as a part of the regular daily routine becomes another matter. In this lies the greatest value of the toothbrush drill and not in the actual brushing at the time. Let us by all means have these drills, but let us see that proper methods of brushing be adopted and let us use reason in carrying them out.

We teach the use of the individual cup; we urge the children to refrain from putting pencils in their mouths; and at length do we speak of that greatest of dangerous habits, coughing and sneezing without protecting our neighbors. Let us hold these drills out of doors. Wet your toothbrush and rub the end of your thumb over the bristles and note the spray that flies from it. In these toothbrush drills let us not so proceed that we create a worse condition than would be created by promiscuous coughing and sneezing.

Were there no other benefit to be derived from the use of the toothbrush than that of the psychological effect produced it would still be well worth our while. Booker T. Washington noted a marked relation between oral hygiene and mentality. He stated that as soon as he could get a colored man to use a toothbrush that he could make a man of him.

Every hygienic measure adopted strengthens the position of others that may be in practice, but in the whole field of hygiene there is no single part that can approach the hygiene of the mouth in importance. In preventive medicine there is no measure which is as far-reaching, and in the matter of expenditure of time or of money in carrying out a mouth hygiene program the returns in each and every case stamp it as much more than a measure of economy.

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□

The papers of the Symposium on Mental Hygiene presented at the San Francisco meeting of the Association are scheduled for the May issue of the JOURNAL.

A BRIEF STATISTICAL STUDY OF RECENT EXPERIENCE WITH MEASLES AND WHOOPING COUGH IN MASSACHUSETTS

JONATHAN E. HENRY, M. D., C. P. H.,

Epidemiologist, Massachusetts Department of Public Health, Boston, Mass.

The measures against measles and whooping cough should be conducted principally in the age group of less than three years. This is the dangerous period, eighty-five percent of the mortality being here. The two diseases should awaken equal concern. Careful medical attention and adequate nursing service are suggested among the important needs.

FROM 1913-1919 (inclusive) there were in Massachusetts 2,091 deaths from measles with 152,877 reported cases; while during the same period 37,637 cases of whooping cough caused 2,384 deaths, giving a fatality rate of 1.3% for measles and 6+% for whooping cough.

These are general rates for all ages and, like most general rates, conceal some very interesting facts which can be brought out by a study of the distribution of cases and deaths by age groups.

TABLE I

Deaths from Measles and Whooping Cough in Massachusetts by Age Groups. 1913-1918*

Age Groups	Measles			Whooping Cough		
	Number of Deaths	Percent of Total Deaths at Stated Age	Percent of Total Deaths at less than Stated Age	Number of Deaths	Percent of Total Deaths at Stated Age	Percent of Total Deaths at less than Stated Age
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Under 1	565	29.6	....	1,152	55.8	....
1	719	37.7	29.6	532	25.8	55.8
2	233	12.2	67.3	177	8.6	81.6
3	119	6.2	79.5	83	4	90.2
4	84	4.4	85.7	52	2.5	94.2
5-9	95	5	90.1	60	2.9	96.7
10-14	17	.9	95.1	2	.1	99.6
15-19	12	.6	96	1	....	99.7
20-29	34	1.8	96.6	2	.1	99.7
30-39	11	.6	98.4	2	.1	99.8
40-49	8	.4	99	....	....	99.9
50-59	4	.2	99.2	....	....	99.9
60-69+	7	.4	99.6	2	.1	99.9
Totals	1,908	100	100	2,065	100	100

*The age distribution tabulations of 1919 deaths have not yet been issued from the Secretary of State's Office.

Table I gives the distribution of the deaths for both diseases for 1913-1918 inclusive.

No age distribution case records are available prior to 1918, but for 1918 and 1919, 35,722 reported cases of measles and 12,420 cases of whooping cough have been tabulated by ages in Table II.

TABLE II

Morbidity of Measles and Whooping Cough in Massachusetts by Age Groups 1918-1919

Age Groups	Measles			Whooping Cough		
	Number of Cases	Percent of Total Cases at Each Age	Percent of Total Cases at less than Stated Age Number of Cases	Number of Cases	Percent of Total Cases at Each Age	Percent of Total Cases at less than Stated Age
(1))	(2)	(3)	(4)	(5)	(6)	(7)
Under 1	1,067	3.	....	1 321	10.6	....
1	2,391	6.7	3	1,329	10.7	10.6
2	3,022	8.5	9.7	1,434	11.5	21.3
3	3,190	8.9	18.2	1,548	12.5	32.8
4	3,466	9.7	27.1	1,347	10.8	45.3
5	3,832	10.7	36.8	1,419	11.4	56.1
6	4,857	13.6	47.5	1,415	11.4	67.5
7	3,611	10.1	61.1	970	7.8	78.9
8	2,406	6.8	71.2	546	4.4	86.7
9	1,508	4.2	78.	347	2.8	91.1
10-14	2,976	8.3	82.2	470	3.8	93.9
15-19	1,115	3.1	90.5	59	.5	97.7
20-24	940	2.6	93.6	54	.4	98.2
25-34	958	2.7	96.2	79	.6	98.6
35-44	280	.8	98.9	32	.3	99.2
45-54	78	.2	99.7	22	.2	99.5
55+	25	.1	99.9	28	.3	99.7
Totals	35,722	100	100	12,420	100	100

Table III gives the fatality rates for both measles and whooping cough during 1918 by ages. For measles, 29,212 cases are involved with 532 deaths, and for

whooping cough 7,764 cases and 729 deaths.

TABLE III

*Fatality Rates for Measles and Whooping Cough in Massachusetts in 1918

**By Age Groups

Age Groups	Measles			Whooping Cough			
	Number of Cases	Number of Deaths	Fatality Rates	Number of Cases	Number of Deaths	Fatality Rates	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Under 1	810	140	17.3	832	232	40	
1	1,934	210	10.8	866	212	24.5	23.5
2	2,505	69	3.6	935	73	7.8	
3	2,571	36	1.4	978	41	4.2	
4	2,809	20	.7	873	32	3.7	
5-9	12,831	24	.2	2,813	34	1.2	
10-14	2,546	5	.2	287	1	.3	
15-19	1,029	4	.4	41	..		
20-24				29	2		
25-34				56	1		
35-44	2,177	24	1.1	20	..	2.9	
45-54				17	..		
55-64+				17	1		
Totals	29,212	532	1.82	7,764	729	9.25	

Table IV gives the ratio of distribution of each disease to the distribution of population in each age group. Such a ratio might be called the index of incidence of a disease in each age group.

Thus in 1918 in Massachusetts we find that 2% of the population (this percentage is assumed to have remained practically constant since 1915) is under 1 year old, but we find 3% of our measles and 10.6% of our whooping cough occurring in the same group. Now if this group has 2% of the population, then 2% would be the incidence expected for both of these diseases. Instead we have 3% and 10.6% respectively, or 1.50 and 5.30 times as much. This is taken as the index of incidence.

TABLE IV

Index of Incidence of Measles and Whooping Cough in Massachusetts in 1918 and 1910 by Age Groups

	Measles		Whooping Cough		
	Percent of Population in Each Age Group in 1915	Percent of Cases in each Age Group	Index of Incidence	Percent of Cases in each Age Group	Index of Incidence
(1)	(2)	(3)	(4)	(5)	(6)
Under 1	2.04	3.	1.47	10.6	5.20
1	1.94	6.7	3.45	10.7	5.52
2	1.98	8.5	4.30	11.5	5.81
3	1.96	8.9	4.55	12.5	6.38
4	1.92	9.7	5.10	10.8	5.65
5	1.86	10.7	5.75	11.4	6.14
6	1.85	13.6	7.35	11.4	6.16
7	1.88	10.1	5.37	7.8	4.15
8	1.81	6.8	3.76	4.4	2.41
9	1.68	4.2	2.50	2.8	1.66
10-14	8.2	8.3	1.01	3.8	.46
15-19	8.5	3.1	.36	.5	.06
20-24	9.8	2.6	.27	.4	.04
25-34	17.5	2.7	.15	.6	.03
35-44	14.7	.8	.04	.3	.02
45-54	10.8	.2	.02	.2	.02
55-64+	11.6	.1	.01	.3	.02
Totals	100	100	....	100	....

This index, then, is a true indication of incidence in each age group since it takes into consideration both the population in a group and the number of cases. The percentage distribution of cases does not consider the population of the different age groups and does not, therefore, give comparable figures for the different ages; but, as a matter of fact, the percentage distribution figures do give a practical comparison of incidence for the different ages under 10, since (see Table IV, column 2) the populations in these years happen to be nearly the same.

The index figure, however, is the best one to use and it is unfortunate that we have fallen into the habit of making comparisons between the distribution of cases and deaths in different ages without taking into consideration the populations in those ages.

The figure involves the question of immunity and susceptibility to certain diseases at certain ages and is in some degree an expression of their value; but

*Ages were given for all deaths but about 10% of the cases in this table were reported without age designation. In order to use these cases and not make the fatality rates disproportionate they were redistributed in age groups in proper proportions.

**It is noted that the fatality rates for 1918 of 1.82% for measles and 9.25% for whooping cough are higher than the 7 year average of 1913-1918, when the figures were 1.3% and 6%, respectively. This is thought, in a measure at least, to have been due to influenza. Also scarcity of physicians in 1918 in many localities probably resulted in poorer reporting than has ordinarily been the case. Furthermore, the classification of deaths from the primary and secondary causes given on death certificates has been done since 1916 according to the U. S. Census publication "Index of Joint Causes of Death." This is now being done by many of the states and is an improvement in that it makes the statistics of the various states more comparable. It is probable that under this system some deaths are credited to measles and whooping cough that formerly would have been credited to causes that were really secondary.

these are only two of many complex factors involved in the figure. We must consider (to mention only a few other things) place and degree of exposure. Place involves rural and urban conditions, temperature, climate, living conditions, wages and civilization, character of population, race, occupation, etc. Degree of exposure involves the natural broadening of associations as the child grows older, the increasing facilities for travel, etc.

Now, if two index figures that are to be compared be considered as made up each of a number of factors, some of which are constants and some of which are variants, then the index figures themselves are expressions of the variants. In comparing the indexes of incidence of a given disease at different ages, if we were to consider immunity and susceptibility as the variants, then these indexes would themselves express the degree of immunity and susceptibility to that disease at different ages, provided that, and in proportion as, the other factors are reduced to constants. This is not possible to do except perhaps in a very gross way and the conclusions, therefore, would not be accurate.

Thus if we could correctly assume the average Massachusetts conditions of climate, population, living, etc., in 1918 and 1919 to be constant for the two diseases and the proportionate amounts of exposure to the diseases at given ages also to be constant, then the variants which would be mainly immunity and susceptibility might be approximately evaluated by the indexes themselves. But at once it is evident that the assumption is incorrect; since, for instance (Table IV, Columns 4 and 6), whooping cough would occur in higher proportions in the early ages than would measles, giving a higher proportionate exposure in those ages and, furthermore, the length of effective exposure is likely very much longer. Many other factors could not be established as constants.

It is, therefore, practically impossible to fix values for the individual factors that make up this figure, however interesting may be speculation along these lines.

Tables V and VI give the total number of cases and indexes of incidence of whooping cough and measles by ages and months. The indexes of incidence are, of course, calculated from the percentage distribution of population by ages (Table IV, Column 2) and the percentage distribution of the cases by ages. The intermediate calculations are omitted. This table shows that the incidence is seemingly higher in the early ages for both diseases during the hot months instead of the winter months. Speculation as to the cause of this would be interesting.

CONCLUSIONS

(1) Approximately 33% of the whooping cough and 18% of the measles in Massachusetts are in children *under 3*.

(2) For a period of years (1913 to 1918) 90% of the deaths from whooping cough and 79½% of those from measles have been *under 3 years old*.

(3) The apparent fatality rates for the group, *under 3* in 1918 were 23½% for whooping cough and 8% for measles.

(4) For each thousand reported cases of measles in 1918 in Massachusetts there were 18 deaths and *14 of these were under 3*.

(5) In the same year each thousand cases of whooping cough represented 92 deaths and *77 of these were under 3*.

(6) Even though there has been, on an average, 4 or 5 times as much measles, the whooping cough fatality leads for the six years (1913-1918) with 2,065 deaths compared with 1,908 for measles. This is a total of 3,973 deaths from the two diseases and 3,378 were *under 3*.

(7) Measles is more prevalent but less fatal; whooping cough less prevalent but more fatal. In the end they cause almost equal numbers of deaths and should cause us equal concern.

(8) Measuring our success by a reduction in deaths from these diseases it is at once apparent that our results de-

TABLE V.

TABLE V.

TOTAL CASES* AND INDEX OF INCIDENCE** OF MEASLES AND WHOOPING COUGH IN MASSACHUSETTS BY AGES AND MONTHS IN 1919.

WHOOPING COUGH

(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)		(13)	
	January		February		March		April		May		June		July		August		September		October		November		December	
Ages	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I
−1	25	3.1	37	5.2	41	4.2	34	4.4	42	4.3	44	4.6	70	7.3	44	5.1	33	4.7	36	4.8	60	4.4	83	4.4
1	35	4.5	30	4.4	32	3.6	34	4.6	39	4.3	34	3.8	49	5.4	53	6.4	53	7.8	38	5.3	47	3.6	81	4.8
2	43	5.5	34	4.9	52	5.7	37	4.9	48	5.2	36	3.9	41	4.4	55	6.8	40	5.8	38	5.2	65	4.9	77	4.2
3	48	6.1	36	5.3	45	5.0	47	6.4	44	4.7	39	4.3	47	5.1	60	7.1	43	6.3	51	7.1	73	5.5	107	5.9
4	43	5.6	28	4.1	32	3.7	40	5.4	48	5.2	46	5.0	38	4.1	42	5.0	34	5.0	35	4.8	51	3.9	100	5.5
5	54	7.3	47	7.3	37	4.3	36	5.1	49	5.6	43	4.9	42	4.8	39	4.9	32	4.9	39	5.7	78	6.2	108	6.3
6	48	6.5	43	5.7	66	7.8	37	5.3	48	5.5	53	6.1	35	4.2	28	3.8	28	4.3	48	7.1	76	6.1	130	7.6
7	26	3.5	31	4.6	54	6.1	35	4.9	52	5.9	37	4.2	28	3.1	19	2.4	21	3.2	24	3.4	65	5.1	62	3.6
8	20	2.8	14	2.2	25	3.0	16	2.3	15	1.8	19	2.3	27	3.1	9	1.2	8	1.3	24	3.4	65	5.1	51	3.0
9	8	1.2	11	1.9	20	2.6	15	2.4	14	1.8	18	2.3	9	1.1	6	.9	7	1.2	14	3.1	31	2.5	51	3.0
10–14	12		16		17		11		25		14		11		10		9		8	1.3	18	1.6	9	.6
15–19	1		2		2		1		2		1		3		1		1		10		37		32	
20–24	..		2		1		1		..		1		15		3		3		..		4		2	
25–34	2		..		1		3		2		4		3		3		1		1		2		1	
35–44	..		1		..		1		..		1		..		2		..		2		2		4	
45–54	1		1		..		..		..		..		2		..		..		3		3		5	
55–64	..		1		..		..		..		..		..		2		..		..		..		2	
65	1		..		..		..		..		..		1		1		..		..		..		1	
Unknown	31		14		34		31		43		77		50		50		35		22		58		68	

*—In ordinary type.
**—In heavy black type.

TABLE VI.

TOTAL CASES* AND INDEX OF INCIDENCE** OF MEASLES AND WHOOPING COUGH IN MASSACHUSETTS BY AGES AND MONTHS IN 1919.

MEASLES

(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)		(13)	
	January		February		March		April		May		June		July		August		September		October		November		Decemb	
Ages	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I
−1	21	2.0	14	1.5	30	1.9	48	2.3	37	1.4	31	1.7	22	2.3	7	2.6	11	3.0	14	1.2	35	1.6	61	1.1
1	41	4.1	24	2.7	43	2.8	63	3.1	71	2.8	65	3.8	27	3.0	20	7.7	21	6.0	44	4.0	73	3.6	141	2.8
2	39	3.9	32	3.6	59	3.8	86	4.2	83	3.2	60	3.4	60	6.8	17	6.8	15	4.2	33	3.0	87	4.1	174	3.4
3	46	4.6	33	3.6	67	4.4	89	4.3	118	4.6	74	4.2	54	5.9	25	9.7	19	5.4	42	3.7	93	4.8	193	3.8
4	47	4.8	46	5.3	70	4.7	85	4.1	114	4.8	60	3.5	54	6.0	14	5.6	11	3.3	55	5.1	101	4.9	256	5.1
5	38	4.0	52	6.2	82	5.7	118	6.1	137	5.7	86	5.2	59	6.7	9	3.7	25	7.8	56	5.4	148	7.5	191	4.0
6	48	5.1	39	4.6	111	7.7	133	6.9	180	7.4	122	7.4	55	6.3	10	4.1	28	8.5	98	9.5	155	7.8	377	7.8
7	46	4.8	57	6.7	95	6.5	104	5.3	143	5.8	78	4.6	31	3.5	5	2.0	17	5.0	63	6.0	110	5.7	283	5.8
8	33	3.6	29	3.5	42	3.0	83	4.2	93	3.9	52	3.1	27	3.2	1	.4	10	3.1	50	4.9	68	3.5	200	4.2
9	23	2.7	23	3.0	31	2.4	41	2.3	47	2.1	21	1.4	16	2.0	4	1.8	3	1.0	18	1.9	39	2.2	107	2.4
10–14	50		43		47		65		106		60		27		4		9		25		55		171	
15–19	17		17		17		21		26		21		..		2		3		7		8		41	
20–24	11		13		21		13		9		15		7		1		2		10		6		16	
25–34	8		4		20		15		14		6		8		1		1		3		6		25	
35–44	1		7		7		4		4		1		2		1		1		1		5		11	
45–54	3		..		3		3		2		3		..		..		..		..		..		1	
55–64	..		..		..		1		..		..		..		1		..		..		..		..	
65+	..		2		1		1		..		..		..		1		..		1		..		..	
Unknown	37		17		32		73		122		136		20		9		3		40		70		255	

*In ordinary type.
*In heavy black type.

pend very largely on how successfully we prevent measles and whooping cough *in children under 3*, among whom about 85% of the deaths occur (90% whooping cough; 79½% measles).

(9) Propaganda and methods of control should be more specifically directed at the *age group under 3*.

(10) It cannot be emphasized too strongly that in these dangerous years, when so many children die of measles and whooping cough or their complications, the most careful medical attention and nursing are needed to prevent dangerous complications.

□

PROGRAM OF THE BUREAU OF SOCIAL HYGIENE OF THE CALIFORNIA STATE BOARD OF HEALTH

WALTER M. DICKIE, M. D.,
Executive Health Officer, State Board of Health,
Sacramento, Cal.

Read before Session on Personal Hygiene, American Public Health Association, at San Francisco, Cal., September 15, 1920.

THE Bureau of Social Hygiene of the State Board of Health was established August 13, 1917, as a war emergency, to coöperate with the Army and Navy in reducing the spread of venereal disease in the men stationed in California and to prevent these diseases in the civil population of the state. Military efficiency demanded healthy men and the records of our draft army later showed appalling conditions in the individual communities throughout the country and immediately revealed the necessity of enlarging our program and extending the work as rapidly as possible throughout the whole state.

The original functions of the Bureau were outlined as follows:

1. To secure the reporting by physicians of cases of syphilis and gonococcus infection, together with the probable sources of infection.

2. To discover foci of infection and to isolate infectious persons, whenever necessary, to prevent the spread of venereal disease.

3. To secure the coöoperation of cities and counties in caring for men and women isolated on account of venereal disease in public hospitals until no longer infectious.

4. As far as possible to secure the medical examination for venereal disease in male and female prisoners and other persons.

5. To focus on this subject the social forces necessary to give the foregoing individuals an opportunity to enter into productive occupations under conditions fair to themselves and to the communities.

6. To provide the necessary facilities for diagnosis and treatment.

7. To issue printed pamphlets, cards, placards and care for exhibition of films and presentation of lectures to appropriate groups.

8. To coöperate with the Army and Navy, the United States Public Health Service and all state and local agencies directly or indirectly interested in conditions or causes which lend to the spread of venereal disease.

In order to carry out this extensive program it became necessary to divide the Bureau into three divisions, namely: Medical, Social Service and Educational.

Medical.—The work of the Bureau was handicapped in the beginning because there were almost no facilities with which to work, so it was necessary immediately to provide increased hospital and

dispensary facilities. Many county and other hospitals which had not, up to this time, admitted venereal cases, were prevailed upon to admit them the same as those suffering from other diseases.

Special hospitals were established in the four largest centers of population in the state, for the purpose of caring for those who had passed through the courts and who had been arrested on charges involving moral turpitude and who had been found infected with venereal disease. In some places both men and women were detained and treated until they were found non-infectious. Since 1917, 4,448 persons have been treated in these hospitals.

The next step was the establishment of clinics throughout the state, which would provide free medical treatment for the large group of persons who were infected and who would otherwise be deprived of adequate treatment. Ten free clinics have been established in the various communities, while five others have been enlarged through state and federal aid, and special clinics have been established for children. In connection with each clinic there has been provided a social worker, whose duty it is to see that patients do not lapse in their treatments; to discover foci of infection and through social service work bring in those suspected of being infected. The social service workers alone have brought in 1,926 cases and returned for treatment 2,350 cases during the last fiscal year. The Bureau has also furnished to date, free, to the various hospitals and clinics, 22,285 ampoules of salvarsan for treatment of indigent cases. The number of treatments given during the year just ended was 77,180.

Rules and regulations have been passed by the State Board of Health, under which these patients, as well as private patients, are required to take the necessary amount of treatment.

Physicians and health officers are required to report each case by number to the State Board of Health and to furnish the name and address of a patient if he or she discontinues treatment. This information is furnished the Health Officer, who is held responsible for the control of the individual so reported.

Social Service.—Two years ago a Social Service Department under the direction of Mrs. Elizabeth McManus was established, which now consists of a Social Service Director, four field workers, and a social service worker connected with each clinic. One of the contributions made by the Social Service Department has been the education of the public through the various organizations of the community, to the fact that a large percentage of the cases have been innocently contracted and, therefore, the fact that one is infected with venereal disease does not necessarily imply immorality.

The social workers attached to the various clinics have held to this idea and have considered the infected persons coming under their care as patients, rather than as offenders against the law. This has had the effect of building up the number of voluntary treatments, and where originally it was difficult to find anyone who visited a clinic without persuasion, now the number voluntarily seeking treatment steadily grows. This holds true not only of the clinics, but private physicians, as well, testify to the increased number of treatments where social workers are active in the community. The social worker coöperates with all social agencies, such as health departments, courts, probation departments, police departments, hospitals and other agencies which may contribute to the number of cases, and acts as a clearing house in the community.

In this connection an interesting piece of work which is being developed in the state is in connection with the psychopathic cases. Through the coöperation of the psychopathic court and the various insane asylums, the relatives of persons suffering from mental diseases due to syphilis committed to these institutions are reported to the Bureau of So-

cial Hygiene, and visited by a social worker, who endeavors to see to it that all infected members of the family are placed under treatment. By this means a large number of people who otherwise probably would be unable to receive any treatment are taken care of. It is also our desire, as quickly as possible, to extend this follow-up work to the families of all infected cases admitted to other state institutions.

The social worker seeks to discover persons in the community who need medical attention, either making arrangements for their treatment at the clinic, if unable to pay the physician's fee, or suggesting treatment by private physicians, if the patient is able to pay. She reports once a month to the Bureau of Social Hygiene on all cases brought in by her, and also must report all cases discontinuing treatment without the permission of the physician.

The duties, primarily, of a social worker connected with a venereal disease clinic are:

First: To discover cases in the community requiring treatment, and to place such cases under treatment.

Second: To see that cases continue treatment until dismissed by the physician.

Third: To make every effort to improve conditions, through coöperation with all available agencies; to remove the cause of infection through education; assisting in finding employment for young women in need of it; establishing better detention facilities through hospital care, and all other such work as will tend toward the decrease of problems leading to infection.

Education.—The Social Service Department has assisted in educating the community to the need of the care and protection of its juveniles and the rehabilitation of its unfortunates.

The department has endeavored to teach that the burden of responsibility is upon the community rather than upon the individual and that prevention is of far greater value than cure. It has advocated and assisted in the establishment of industrial schools, proper detention homes for women and the State Industrial Farm, with the idea of re-educating the unfortunates, while special stress has been put upon the responsibility of the parents. It has succeeded in interesting civic groups and in calling the attention of school authorities to the fact that the solution of the problems is one in which they are directly interested.

During the biennial period ending June 30, 1920, 218 lectures were given before 42,000 persons. These lectures were delivered by the members of the Bureau and specially qualified volunteer lecturers in the various communities. They are in many instances arranged for by the local worker and in one instance our social worker has talked before practically all the organizations of the community. Through our local representatives in the various communities, we are able to keep up a very effective continuous campaign of education. During the last two years 200,000 pieces of literature have been distributed by the Bureau, while no less than 487,000 persons have seen the Bureau's charts and lantern slides, and more than 50,000 have witnessed our picture films on social hygiene.

Special courses of lectures on venereal disease and social hygiene have been given to the student nurses in the various training schools.

Such, briefly, is the summary of the educational work of the Bureau. The daily mail, bringing in its many requests for information and literature, indicates that the word "passed" from old patients to the newly-infected persons is manifold. The indirect results of the educational work we have no way to determine but the continued interest of the general public in the work indicates that information on venereal diseases and their control is earnestly desired, and we know that we are providing a service, not only to the infected individuals, but important for the welfare of future generations.

SYMPOSIUM ON HEALTH SUPERVISION IN COLLEGES

I. EDUCATION IN HEALTH AT CORNELL UNIVERSITY, 1919-1920.

HAVEN EMERSON, M. D., LAWRENCE B. CHENOWETH, M. D., FRANK C. BALDERRY, M. D., and CLAUDE E. CASE, M. D.

Of the Department of Hygiene and Preventive Medicine, Cornell University, Ithaca, N. Y.

Presented at Session on Personal Hygiene, American Public Health Association, at San Francisco, Cal., Sept. 15, 1920.

IN October, 1919, there appeared in this JOURNAL (Vol. IX, No. 10, pp. 749-760) an article by Associate Professor Eugene C. Howe, Ph.D., of Wellesley College on "The Health of the College," in which he analyzes and reports upon the status of hygiene and sanitation as maintained and taught at 74 American colleges and universities. The authorities, overseers, trustees, faculties and presidents of these and other institutions of higher education, including medical colleges, cannot fail to appreciate the extent of the shortcomings exhibited. Instead of demonstrating the best possibilities of application of practice and education in the theory of personal, group and intergroup hygiene and sanitation, the great majority of colleges fail to make the most elementary provision for protection of the student and his teachers by control of environment, food, air, water, housing, study and recreation facilities, and miss their obligation and opportunity to establish in the student's life the habit of annual medical examination and the prompt recourse to a physician upon the appearance or suspicion of abnormal function or structure, the principles upon which he must rule his life and guide that of his associates and dependents in order to acquire and maintain rugged health.

The intent of Cornell University to provide for its student body a type of education and health protection which would meet the best conception of hygienists, educators and sanitarians crystallized in September, 1919. The following record is offered as a continuation of the response to Professor Howe's article.

PLAN AND PERSONNEL

Under agreement with the Inter-Departmental Social Hygiene Board at Washington, D. C., and in compliance with certain professional medical and didactic requirements specified in the terms of the agreement, and with financial aid granted by the Federal Government, Cornell University put into effect in September, 1919, a compulsory system of education in Hygiene and Preventive Medicine, together with medical examination in and supervision of the health of the students.

A Department of Hygiene and Preventive Medicine was established in the University Faculty. The personnel provided for consisted of:

1 Professor.
1 Assistant Professor.
1 Chief Medical Adviser.
7 Assistant Medical Advisers.
(5 for men, 2 for women)
1 Chief Clerk.
2 Assistant Clerks.
(1 for men's department)
(1 for women's department)

Special lecturers were obtained from among the various faculties of the University and from outside sources, i. e., other universities and the field of public health.

Student help was obtained to assist in checking attendance at classes and in filing records.

Lectures were given by the Assistant Professor and by one of the Assistant Medical Advisers for men in some of the elective courses in Hygiene in the Department of Physical Education. Some of the lectures in the required course in

Hygiene and Preventive Medicine for first and second year students were given by the Assistant Professor and by the senior medical adviser for women.

The work of the department has consisted of the following:

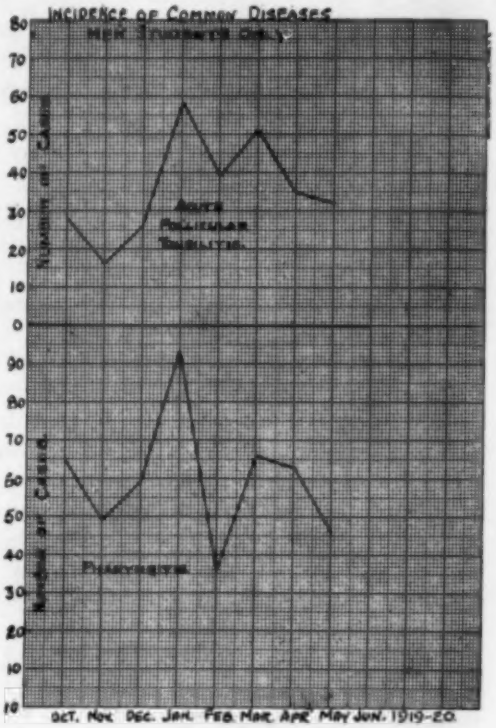
1. Medical Examinations.
2. Medical Consultations.
3. Instruction in Hygiene and Preventive Medicine.
4. Medical Conferences.
5. Sanitary Supervision and Control of Communicable Diseases.

MEDICAL EXAMINATION ON ADMISSION

Every student is required to have a medical examination each year. Students are excluded permanently, or separated temporarily from the university only for diseases in communicable stages which might be conveyed to fellow students or teachers. The existence of physical defects is not a cause of exclusion. Students have been excluded for tuberculosis and for venereal diseases. The examination is thorough and involves the family and personal history, and the inspection, palpation, percussion, auscultation, and where necessary measurements of the body. The clothing is removed for the examination, which is done with entire respect for the privacy of the student, the students being examined one at a time in the private office of one of the medical examiners. The objects attained are (a) the detection of the various defects due to disease or faulty development which may be or should be removed or corrected by medical or surgical means or through suitable exercise or management of regimen at college; (b) The recording of such students as may safely be permitted to engage in major competitive sports, those who must be followed up if they enter for competitive athletics to ensure their avoiding strain or permanent injury, and those who must take regular exercise under direction in order to acquire sound physical health.

For the 5,421 students (1,169 of them women) there are eight medical examiners employed on full time, and on duty seven hours a day throughout the college year. Two examiners are on duty on Sundays. Two of the examiners are women physicians caring for women students. The examinations are completed in the first semester (September

CHART 1


INCIDENCE OF COMMON DISEASES
MEN STUDENTS ONLY
Number of Cases
Acute Follicular Tonsilitis.
Pneumonia.
Oct. Nov. Dec. Jan. Feb. Mar. Apr. May Jun. 1919-20.

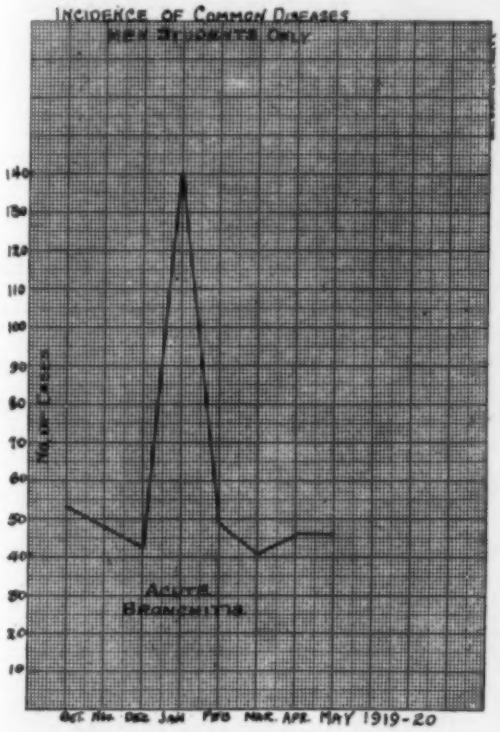
to January inclusive), and are shared in equally by all examiners with unimportant variations due to special assignments for consultation service during the fall football season and for medical consultation work for the daily sick attendance.

First year students receive the earliest attention. The other classes are called in by appointment in turn. The number of examinations made for this purpose by each physician varied from 400 to 900 during the 16 weeks of the first semester. The time for each examination varied from 15 to 30 minutes, the shorter time being common among the upper class

students whose previous medical records made saving of much time possible. Form A is used for the examination record of the student for four years.

Orthopedic examination is made in all cases. Examination of urine, blood and blood pressure are made only when considered necessary to explain or support items brought out in the history and physical examination. Test with Snellen's chart is used as a routine and more detailed examination of the vision, is undertaken by one member of the staff, especially trained in this field, only when there is some difficult, unusual or uncorrected visual defect.

CHART 2



Restriction of academic program and compulsory physical training are required when the physical condition of the student requires it. Dental examination is made by direct inspection, but without the use of mirrors or instrumental search, and not by a dentist.

The information obtained in the family history of students was used to bring home to them the relative importance of the causes of death and of the preventable causes among those which had occurred among their own family, *i. e.*, deaths of father, mother, brother, sister, aunt, uncle or grandparent. It is of much educational value to point out to a body of students that 319 of the students did not know the causes of deaths of their immediate relatives, that in 13.6% of the instances where the cause of death was known, the death was due to tuberculosis; 30.2% to pneumonia and the acute communicable diseases; 11.4% to valvular heart disease and diseases of the arteries; 9.3% to cancer and that in 9% there was trachoma, 2.4% diabetes, etc. The teaching of hygiene to healthy young men and women requires the use of all devices and opportunities to make the matter one of intimate personal importance. The wish for self preservation, as well as the impulse of selfish action for the public good must be built upon to create interest in the philosophy and practice of health.

The personal history of the students in 5,421 of the required medical examinations, and at 16,582 consultations, when the students came for advice as to their health, elicited invaluable material for educational, corrective and supervisory purposes. To avoid extensive presentation of statistical data, which has been tabulated by disease, according to the international nomenclature, by sex, by class and by time of occurrence if the disease developed at the University, only the important summaries will be given here. The 5,421 students gave histories of having had a total of 8,496 cases of the acute communicable diseases of childhood, measles, mumps, chicken pox, whooping cough, scarlet fever and diphtheria, in that order of frequency; 259 cases of typhoid, three of para-typhoid, two of amebic dysentery, 26 cases of smallpox, 600 of influenza, 525 of pneumonia, 722 of acute follicular ton-

FORM A

DEPT. OF HYGIENE AND PREVENTIVE MEDICINE

1776

CORNELL UNIVERSITY

Phys. Class..... Serial No.....

Medical Examination

Name College Class

(Print) Last First Middle

Home Address Nativity

Family History

Personal History

Age Vaccination Date

Habits—per day—Pipes Cigars Cigarettes

Date	1st Year		2nd Year		3rd Year		4th Year	
General Condition								
Posture								
Skin								
Superficial glands								
Thyroid								
Weight; Height	Wt.	Ht.	Wt.	Ht.	Wt.	Ht.	Wt.	Ht.
Vision	R.	L.	R.	L.	R.	L.	R.	L.
Corrected glasses								
Eyes								
Ears								
Hearing	R.	L.	R.	L.	R.	L.	R.	L.
Teeth: Care								
Pathology								
Nose								
Throat								
Chest								
Lungs								
Heart								
Abdomen								
Hernia	R.		R.		R.		R.	
	L.		L.		L.		L.	
Spine								
Feet	R.		R.		R.		R.	
	L.		L.		L.		L.	
Reflexes R.	Eye	K.J.	Eye	K.J.	Eye	K.J.	Eye	K.J.
L.	Eye	K.J.	Eye	K.J.	Eye	K.J.	Eye	K.J.

Remarks:

sillitis. Many tropical diseases and accidents, operations and sequellæ of childhood defects of nutrition and of the nervous and mental functions were recorded. One hundred and four had not been vaccinated against smallpox. In 166 cases visits were made to the student's room to establish diagnosis and authorize admission to the infirmary if necessary.

In 864 cases special examinations were made for the purpose of determining fitness for major competitive athletics. Excuses from attendance at college exercises were issued for medical reasons in 6,854 instances, the average duration of excuses being two days. Of the total excuses 970 were issued to women because of menstrual disorders. Twenty-six men were excused permanently from military drill and from gymnasium. Eighty-six men were excused permanently from military drill and were transferred to required gymnasium work. Military drill and gymnasium work were postponed in 51 cases because of recent operation, fractures or illnesses. The record of the consultations and of excuses and the reason for issuing them is kept on Form B and Form C which are continuous for all the years of university attendance. From this record are also obtained the number of days lost on account of illness by each student and by the student body as a whole.

There is no medical examination offered to the teaching staff or to members of their families. There is but slight use made of the facilities available for developmental physical training offered to the teaching staff by the Department of Physical Education.

Some form of physical exercise is required of all students of the first and second years, included under one of the following headings:

1. Compulsory military drill (3 hours per week).
2. Athletics (of which record and attendance is kept).
3. Gymnasium or outdoor exercise (recorded and selected voluntarily).
4. Exercise of various kinds required for correction of defects, in the gymnasium under direction.

Engagement in major sports is permitted only on special examination and after receipt of a medical certificate.

MEDICAL CONSULTATIONS

The medical examiners' offices are open daily from nine to six, except Sundays, when the hours are nine to twelve. The students are encouraged to come to report even the slightest of symptoms or matter of concern to them in regard to their health. There have been 16,582 consultations and a summary of the conditions for which advice has been sought are to be seen in Table I. This is as

FORM B.

DEPARTMENT OF HYGIENE AND PREVENTIVE MEDICINE

CORNELL UNIVERSITY Serial No.....

Consultations

Medical Adviser: Initial each entry

[Print] NAME | COLLEGE | CLASS

DATE AND ADVISER	COMPLAINT—FINDINGS—DISPOSITION	DIAGNOSIS

TABLE I.

1919-1920

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
General Diseases	77	88	80	137	122	59	36	129	10	638
Nervous System and Organs of Special Sense	85	68	67	122	62	116	67	85	17	689
Circulatory System	45	28	29	27	15	11	16	14	5	185
Respiratory System	222	165	194	425	152	218	178	154	23	1,731
Digstive System	221	193	227	346	157	258	207	196	43	1,848
Genito--Urinary system Non-Veneral	19	19	12	12	14	13	17	6	5	117
Diseases of Skin	155	104	84	108	74	94	86	124	41	860
Bones and Organs, Locomotion	37	43	38	54	28	35	36	36	7	324
Affections Produced by External Causes	179	192	165	172	109	184	154	192	58	1,405
Ill-Defined Diseases	90	246	16	27	8	49	33	47	16	532
Total										8,329

nearly as possible a true morbidity report of the entire student population, and when arranged by months and taken in relation to vacation, etc., is of considerable interest. The information was used frequently during the course of class instruction.

Where advice or the simplest of local treatment or medication is all that is needed, the student is not referred to a private physician. Fever, or any condition requiring bed care, results in admission at once to the college infirmary. (No students are permitted to stay in their rooms more than 24 hours on account of sickness.) If bed care is not needed and treatment needing more than temporary observation is required, the student is advised to go to one of a list of reputable practitioners of the town. The student selects the physician.

Care in the infirmary, which is fully equipped and in charge of a trained graduate nurse superintendent, is entirely by private physicians selected by the students. The students' medical fee to the University goes to the support of the infirmary. One dollar a day is charged for infirmary care. The standards of the American College of Surgeons are not maintained at the infirmary, and there is no record left by the private physician of the condition of the students while in hospital, except the bare statement of diagnosis. Excuses for non-attendance at classes are issued by the medical examiner's office. Students report to the medical examiner's office when leaving the infirmary or the care of a private physician.

There were 11 deaths among the student body during the academic year, of

FORM C.

Record of Excuses

NAME _____ COLLEGE _____ CLASS _____

DATE OF ONSET	RECOVERY	DIAGNOSIS	House or Infirmary	Days Lost	PHYSICIAN

which eight were due to pneumonia and empyema, one to acute streptococcus septicemia within 24 hours of appearance of a furuncle on the cheek, one to abscess of lung following acute follicular tonsillitis, one to suicide.

One history of syphilis and one of gonorrhea were obtained in original examination of students. Including these there were discovered a total of ten cases of venereal disease of which eight were gonorrhea and two were syphilis. It is believed that this is an accurate and complete record. Every effort was made through the medical examiners, through private physicians of the town and through the director of student athletics to discover other cases.

The characteristic seasonal incidence of the acute respiratory diseases, and the recrudescence of them on reassembling in the autumn and after the Christmas and Easter recesses, is apparent from a reading of Charts 1, 2, 3, 4.

CHART 3

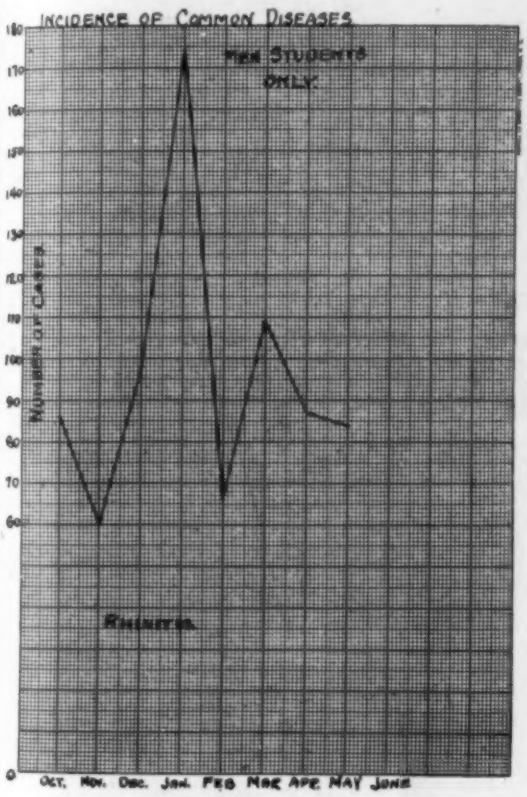
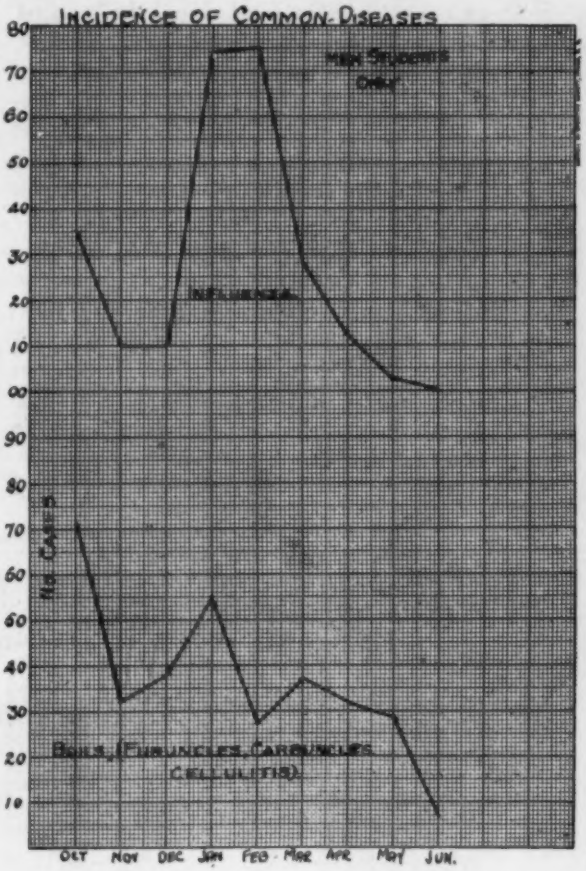


CHART 4



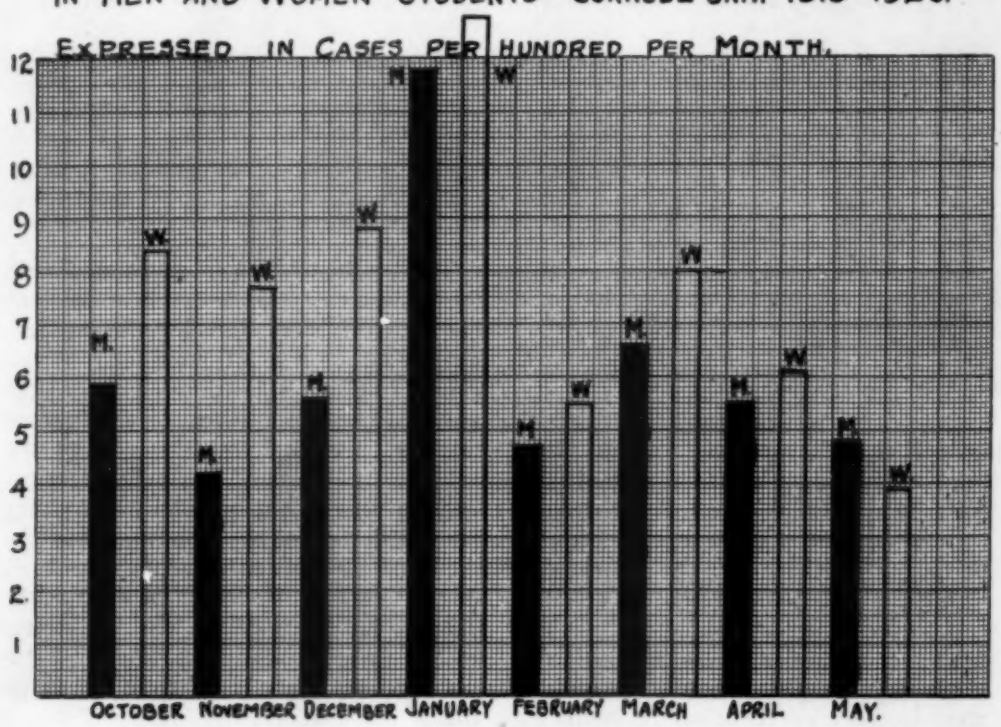
The gradual but marked reduction in the diseases of the skin due to lack of bodily cleanliness and insufficient frequency of change of underclothing, as shown in Chart 4, bears testimony to the value of persistent education in personal hygiene. Charts 5 and 6 show the usual relative incidence of the acute respiratory infections and all illnesses as they prevailed month by month among the men and the women students. Analysis of the time lost on account of disease, the relative incidence of the various groups of preventable sickness to the total experience for men and women, shows that:

Of the total number of days of student time possible for the entire student body, 1.6% of days was lost during the college year on account of sickness. The loss by the women students being 2.4% of their possible total days, the loss of the men being 1.5% of their possible days. Of the total cases of sickness recorded, numbering 8329, 52% were due to sicknesses which fall properly within the designation of preventable diseases; that is, acute respiratory infections, acute infectious diseases, infections and communicable diseases of the skin, and disturbances due to errors of diet or in the use of foods. Of the total cases of sickness, 21% were due to respiratory affections, 7.7% due to acute infections, 10% due to skin affections, 22% due to digestive disturbances, and 16.6% due to external causes.

INSTRUCTION IN HYGIENE AND PREVENTIVE MEDICINE

Hygiene and preventive medicine, a one hour a week lecture course, is required through the first two years of college for students of all colleges. Exemption is permitted by action of the University Faculty when proof is presented of equivalent education prior to entering the University. Mid-term written and final examination and written notes of the course, together with reading and reporting on the subject matter of the text-book of the course (Lee's Health and Disease), are required of all those taking the course. The attendance has been about 2,400, divided into six sections of about equal size. No college credit is given for this course. Defects are obvious in the impracticability of getting direct reaction in question and

CHART 5



reply contact with students, in sections of this size. This is offset to some extent by the conferences with individual students described later. The course has covered the following subjects and has been intentionally divided among a considerable number of lecturers with two objects in view, first to provide the superior quality which comes from specialist handling of certain phases of the work, second, to impress the student body with the breadth of the problem of disease prevention and health development and the extent of the relationship of the subject to the various professional and technical schools they are attending.

LECTURES

1. **Objects and Outline of Course.** Prof. Emerson. Health a product of heredity, environment and personal habits.

2. Prof. Emerson. Report on incidence of acute respiratory tract infections in University and lesson to be learned and means of prevention. Hereditary factors in health. Mendell's Law, feeble mindedness.

3. **Anatomy.** Prof. Sutherland Simpson. Skeleton. Basis for attachments. General description of bony framework. Protection and support for viscera.

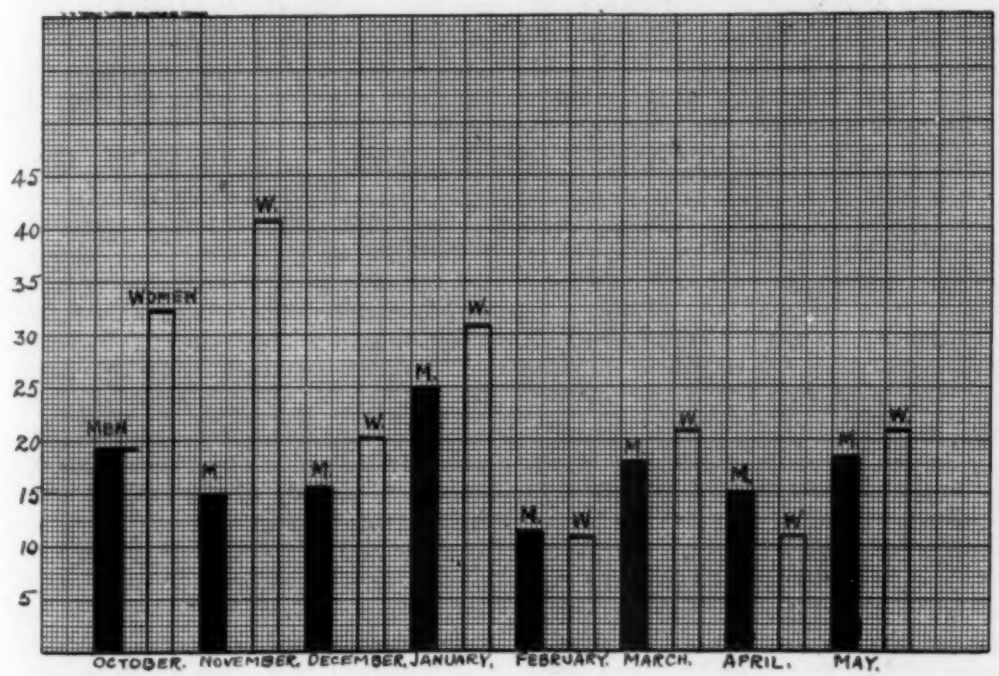
4. **Physiology of Assimilation and Elimination.** Prof. S. Simpson. The processes of ingestion of nourishment, digestion, and the excretion of residue. The gastro-intestinal tract and accessory glands and processes.

5. **Physiology of Respiration and Circulation.** Prof. S. Simpson. With demonstration of the Schaefer method of artificial respiration.

6. **Vital Statistics and Health Con-**

CHART 6

COMPARISON OF TOTAL NUMBER OF CASES OF ALL ILLNESS IN MEN AND WOMEN STUDENTS, CORNELL '19-'20 EXPRESSED IN CASES PER HUNDRED PER MONTH.



trol. Prof. Wilcox. Dependent upon methods of measurement. Vital statistics means of measuring army and civil health. Records show health within human control. Proof that community health is purchasable.

7. **Vital Statistics,** continued. Prof. Wilcox. Areas, classes, and causes of good and bad community health conditions. Limits of probability in death rates. Healthiest and unhealthiest countries, states, region (compare with rural regions). Death rates. Modified by sex, age, race, civil state, occupation. Changes in death rate from tuberculosis; from cancer. Measure of economic loss from typhoid epidemic.

8. **Report of University Health.** Prof. Emerson. Noting improved conditions with regard to acute respiratory tract infections. Special comment upon two groups affected by food poison. Discussion of food poisoning from chemical products; from bacterial action, and in susceptible individuals from wholesome food. Measurement of sickness in army and civil life by morbidity reports. Mortality of disease modified. Diseases without death incidence. Portion of community constantly sick. High and low rates by age and occupation. Morbidity more valuable than mortality to determine policies and measure results. Indices of community's health. Introduction to preventable diseases which are communicable.

9. **Tuberculosis.** Dr. Donald B. Armstrong, Framingham, Mass. Its importance as a cause of death, its history, extent, how it is acquired—prevention, treatment, cure. A disease originating in unsuitable artificially created living conditions and to be overcome by individual and social improvement in these conditions.

10. **Venereal Diseases.** Dr. Wm. F. Snow, American Social Hygiene Association. This lecture was delivered only to the men students. One of the series of lectures under Dr. Snow's direction was given by his assistant, Dr. Kleinschmidt, assistant in the office of the American Social Hygiene Association. This lecture was illustrated by lantern slides and sections of "movie" films used in general public education, and in the army here and abroad. Four lectures for women were given upon this subject by Dr. Eleanor B. Bertine, of the Bureau of Social Education War Work, Council of National Board, Young Women's Christian Association, New York City.

11. **Illustrated Lecture. Dealing with water supplies.** Prof. H. N. Ogden. The dangers of pollution and the methods of their sanitary control and protection. This lecture dealt with both individual private rural supplies and the commercial or community supplies.

12. **Limitation or Control of Communicable Diseases.** Prof. H. Emerson. Control of epidemic, quarantine and disinfection. Means available and desirable.

13. **Sewage Disposal.** Prof. H. N. Ogden. As a means of preventing disease and maintaining cleanliness of soil and water supplies. Disposal of human and industrial wastes and their contribution to the standard of living and general sanitation.

14. **Immunity and Infection.** Dr. Veranus A. Moore. Protective forces of the body, external and internal. **Immunity.** A condition of the body that prevents the development of infecting organisms, but if they are able to multiply, neutralizes their injurious effect—natural, acquired, active, passive, toxic, bacterial. Explanation of immunity, phagocytosis, side-chain theory.

15. **Infection.** Dr. Veranus A. Moore. Especially of the intestine and lungs. Discussion of infection including definition and the various ways by which it takes place in the lungs or intestine or both. Organisms gain entrance to the body through food, milk, water, dust. Description of organisms and tissue re-

action. Lantern slide demonstration illustrating the facts.

16. **Sanitary Chemistry.** Mr. F. R. Georgia, Instructor in Chemistry. Definition of sanitary chemistry. Relation to other sciences. Some applications of sanitary chemistry. Examination of water supplies, water purification, methods and control. Sewage disposal, methods and control. Garbage disposal, methods and control. Food and drug inspection. Control of food manufacture.

17. **Sterilization and Pasteurization.** Prof. H. Emerson. Limitations of control of communicable diseases dependent upon early and accurate detection of infections and diagnoses of cases. Limitation of infection to the infected person. Destruction of infectious discharges. Quarantine or isolation and disinfection which have for their objective the localizing and destruction of pathogenic bacteria. These are only partly effective. Sterilization not synonymous with disinfection. Disinfection not necessarily sterilization. Importance of spore forming bacteria. Sterilization rarely necessary in public health work, except in the case of anthrax, tetanus, and a few other less common infections. Selective sterilization is pasteurization. Pasteurization defined. Sterilization defined. Fractional or intermittent sterilization described. Control of fermentation and putrefaction without heating by drying, smoking, salting, brining, sweetening and sealing of foods. Reasons for pasteurization of milk and milk products. Advantages of pasteurization. Methods and results. Changes in milk due to pasteurization and sterilization. Sterilization as a surgical procedure. Freeing wounds from infectious bacteria by biological processes. Inability to sterilize mouth, skin, bowels and blood without destruction of human cells and tissues. Attempt at "sterilizatio magna" by salvarsan. Biological destruction of bacteria by vaccines and phagocytes.

18. **Food Chemistry.** Prof. G. W. Cavanaugh. Food: General composition, properties and functions. The general composition of food stuffs was outlined under the following heads:

A. Moisture and dry matter.

B. Organic matter and mineral matter or ash.

C. Proteins.

D. Carbohydrates.

E. Crude fiber or cellulose.

Definitions of these several component parts were given. The relation of the chemical composition of these constituents to their function in the body were pointed out, as for example, that the proteins were necessary for cell and muscle building, and the ash of foods were essential to bone making. The relative calorific power of the carbohydrates to fats was explained. It was also pointed out which of our foods were high or low in the several important classes of food constituents.

19. **Administrative Control of Food Supplies.** Prof. Emerson. Public health control of food supplies necessary to secure honesty of labeling, constancy in quality and food value of products, and freedom from poisonous, harmful, inferior or fraudulent substitutes. The functions of a completely developed Public Food Control Bureau under Health Departments. Consideration of Federal Pure Food Law, which is a law against misbranding. Resulting decrease in adulterated food since 1906. Honest labeling the heart and soul of the pure food movement. Standardization of milk control. Meat inspection national and local.

20. **Diseases Due to Disorders of Nutrition.** Prof. Emerson. Nutrition defined. Brief description of what starvation means, indicating that it may follow deprivation of various foodstuffs, including water, according to their relative importance or necessity. Possible duration of life after deprivation of different foods. Excessive luxury consumption of foods, and the economical diets compatible with health and develop-

ment. Classification of diseases caused by food or lack of them: Those due to the quality of the food, that is, chemical and bacteriological constituents having poisonous effects upon humans because of putrefaction or infection. Diseases due to the kind of food or food content (a) Individual susceptibility to a particular food substance, such as fish, berries, etc., effect being similar to serum sickness or hay fever; (b) Individual intolerance to a group of foods as in diabetes and gout; (c) Universal inability to tolerate deprivation of certain substances such as vitamines as well as the more common foods—instances, malnutrition of children, pellagra, berri-berri, scurvy, rickets, war edema, fat starvation, goitre, calcium, iron and salt starvation. Brief description of pellagra, its incidence, death rate, distribution, cause and remedy. Reference to berri-berri and its distribution, noting infinitesimal amount of certain substances found essential to health. Brief reference to scurvy, rickets, and malnutrition of children giving their importance, causes and remedies.

21. **Economic Aspects of Industrial Hygiene.** Prof. C. K. Drinker, Harvard School of Industrial Hygiene. The health of the working population of the United States represents an economic problem of first grade importance. Draft statistics disclose the fact that four hundred and sixty-eight out of every thousand young men examined exhibited some easily detectable physical or mental defect. Many of these defects, such as hernia, are of major industrial importance both to the manufacturer and to the laboring man. The industries present evidence that the hiring of physically defective individuals is a source of great yearly expense to the country. Such men should be accepted for work and placed in jobs fitted to their physical capabilities, thereby reducing the billion and one-half working days which are lost as a result of illness and disability every year. Evidence accumulates to show that minor ills cause a large part of this absenteeism, and the progressive modern manufacturer can only meet these ills through the organization of a thoroughly good health department in his plant.

22. **Hazards of Industry.** Dr. Wade Wright, Asst. Professor of Harvard School of Industrial Hygiene. Conditions peculiar to industry which may affect the health of workers. Conventionally called hazards, and are grouped under several heads: Illumination, Noise, Ventilation, Heat and Cold, Humidity, Poisons, Infections, Fatigue, Mechanical. Consideration of the health of industrial workers a public health problem.

23. **Air, Ventilation and Bodily Cleanliness.** Prof. Emerson. The subject of air was considered as if air were a gaseous envelope serving the functions connected with interchange of gases in respiration and regulation of body temperature. The physical properties and chemical differences of atmospheric and expired air. The facts concerning the oxygen, nitrogen, argon, ozone, hydrogen peroxide, mineral acid contents and CO_2 of the air were dealt with briefly. The physical problems involved in diminishing and increasing atmospheric pressure, the movement of air, the temperature of air, humidity, absolute and relative. Odors, light, smoke, fog, dust and poisonous gases were dealt with. The value of freely flowing cool, clean air as a means of stimulating heart action, respiration, mental and physical alertness and the processes of digestion and metabolism, were considered. The necessity of change of air by motion and the limits within which air and floor space must be controlled for human safety, were touched upon. The value of training of the skin by daily exposure to cold water and cool air was emphasized.

24. **Military Sanitation.** Asst. Prof. J. S. Allen. (To Men.) Necessity for instruction in military science. Necessity for sanitary control in army. Antityphoid and smallpox vaccination; necessity for results. Applies both to civilians

and military. Selection of camp site. Water—necessary, provisions for keeping clean; methods of sterilizing. Soil—kinds, best sandy or sandy loam; clay the worst. Drainage—necessary to prevent mud. Vegetation—poison ivy and brush. Layout of camp. Provide water and latrines first. Kinds of latrines. Location in camp. Protection from flies. Arrangement for use of water in stream—men drinking, horse drinking; wash men, wash clothes.

24. **Flat Feet and Foot Trouble.** Dr. Margarete Baker, Medical Adviser of Women. (To Women.) Percentage of soldiers examined for army service with foot-trouble. Percentage of students with foot-trouble. Foot-apparel: Stockings should not be too short, nor too pointed. Shoes, proper heel, toes, uppers. Flat foot: definition of, mechanism of flat foot; etiology, (1) toeing out, (2) tight stockings, (3) pointed shoes, (4) improper sleeping habits, (5) relaxation of muscles due to fatigue; (6) too early use after illness, (7) injuries. Correction: (a) exercises, (b) wedge-shaped lifts, (c) Whitman's arch, (d) proper walking. *Hallux Valgus*: definition, etiology, treatment. Hammer toe: definition, etiology, treatment. Corns: formation, treatment, soft and hard corns. Ingrowing toenail, etiology, treatment. Excessive sweating of feet, etiology, treatment, mild and severe cases. Chilblains, etiology, treatment. Frost-bite, etiology, symptoms, treatment. Affections of the regions of the heel.

25. **First Aid.** Asst. Prof. J. S. Allen. (To Men.) Accidents are frequent. Persons versed in First Aid procedure should be present. Worst thing to do in case of accident is to lose your head. Wounds are: contused wounds, bruises, etc., skin not broken; lacerated wounds, caused by tears; incised wounds, caused by knives, razors, etc; punctured wounds, caused by nail, pitchfork, etc. Appropriate treatment and dangers of each. Cleanliness. Control of hemorrhage. Use of and position of tourniquet.

25. **First Aid.** Dr. Margarete Baker. (To Women.) Drowning: causation, treatment, resuscitation. Demonstration of: (1) Shaefer's method, (2) Howard's method. Sunburn, Heat-exhaustion, Sun-stroke, Fainting: etiology, lack of blood in brain, habit of fainting, sight of blood or accident, may be sudden or gradual. Treatment. Poison ivy and poison oak. Insect bites and stings burns and scalds: definition of burn, of scald; description of, degrees of burns, symptoms, treatment; acid burns, alkaline burns.

26. **Mental Hygiene.** Dr. Thos. W. Salmon, National Committee for Mental Hygiene. Three phases of mankind's attitude towards disease: Submission, Self-defense, Aggression. Science has given us opportunities to defend ourselves against disease and to attack it, to eliminate it. Defensive mental hygiene protects organ of the mind. Damage from without: syphilis, other infections, alcohol, drugs. Damage from within: endocrine disorders, terminal disease. Fifty percent in New York State hospitals fall in above two groups to be reached by general preventive medicine. Field of eugenics offers possibilities of salvaging defective material.

Positive Mental Hygiene. Undamaged brain present but mental life is full of difficulties. Object of hygiene is "to render growth more perfect, decay less rapid, death more remote, and life more vigorous and successful." We practice mental hygiene if we prevent interference of mind by abnormal fears, anxieties, doubts, inhibitions and compulsions which may ruin the happiness and usefulness of an individual. A personal problem, to be met by individual effort.

Importance of emotional side of mental life. In most important affairs it is feeling rather than thinking and intelligence that plays the greater part. Medical psychology is concerned with emotions

chiefly. Appeals to emotion always indirect, in spite of the dominance of attention to training of intelligence in a university. Emotional life must be studied in the social environment in which human beings live, work, love and die. Reticence in matters of intimate and delicate reactions. Crises in life determined by feelings which we later try to rationalize as bases of thinkings. Necessity for adaptation in emotional matters.

Adapt or perish. Tin hat, gas mask. The wasted instincts in domesticity. Most important mechanisms of human adaptation are largely mental. Types of failure give us mental diseases: psychoneurosis, eccentricities, criminality. The community is essential to make all or part of the adaptation that its individuals are incapable of making themselves. Successful adaptation constitutes mental health, and vice versa.

Causes of more difficult mental adaptations, conflict between free instinctive behaviour and the requirements of society. Casualties from repressions or unsatisfactory solutions. Psychoses, psychoneuroses, suicides, complexes. Effect of bringing exact nature of conflict into consciousness and dealing with it on level on which it originates.

Influence of the war. Great experiment in mental adaptation. Methods of management of the psychoneuroses which resulted from unsuccessful adaptation. Similarity and differences between psychoneuroses of soldiers and those of civil life. Valuation of experience and possibility of duplicating results.

Mental hygiene more than a defense of the central nervous system. Difference between issues of general and mental hygiene, but similarity as to equal importance of knowledge of processes of disease and maintenance of health. Intelligent persons must become familiar with mental as well as physical mechanisms of life. Susceptible to modification and control. Need frankness and fearlessness in nature of important emotional reactions. Reward not chiefly prevention of mental disease, but liberation of resources, elimination of pathological fears and doubts, increase in usefulness to others.

27. **Cancer, and Summary of Principles Dealt With in Course: Results.** Prof. H. Emerson. This lecture dealt with the subject of cancer, its prevalence by age and sex. The necessity of lay information in order to permit of early diagnosis and curative surgery. Cancer not a hereditary, or contagious, or constitutional disease. Cancer a lawless growth of tissue usually due to irritation, friction, ulcers, etc. Not painful in its early stage. Always local in beginning. Characteristic causes of cancer of lip, and mouth, intestinal tract, breast, uterus, and skin. Precancerous stage curable. Operative cure possible in high proportion of cases. Warn against internal medication. No treatment to be used without examination. Massage and Osteopathy unfit. X-ray of value in diagnosis. X-ray and radium of some value in selected cases for superficial and deep cancers. Caustic pastes neither safe nor controllable, and should not replace surgery, which offers best chance of permanent cure.

BRIEF SUMMARY OF PRINCIPLES DEALT WITH IN COURSE AND RESULTS IN STUDENT BODY

We are constantly adapting our bodies and minds to limitations and dangers of artificial group existence. The students have shown that they have acquired the basic understanding of causes and personal prevention of various communicable diseases, and of certain preventable diseases of occupation and diet. They know something of the things which are done for them through sanitation, to them for specific protection, by themselves for their own protection by personal habits, for others as a social group as members of organized society. What have been the results? One and six-tenths percent of all possible days of students' time in the college here have

been lost on account of sickness. Eighty-one hundred and twenty-seven cases of sickness of which forty-six hundred and forty-nine were due to preventable causes as follows: 2,631 respiratory infections such as colds, pneumonia, pharyngitis, laryngitis, tonsillitis; 391 acute infections, chiefly influenza, but including measles, scarlet, mumps, chickenpox, syphilis and gonorrhea; 800 cases of skin affections including boils, furuncles, impetico, body lice, ringworm, scabies; 827 cases of digestive disturbance, including gastritis, enteritis, constipation and indigestion.

On numerous occasions during the year reports were made to the student body as to the health of their community, the prevalence or control of certain communicable diseases or group expressions of preventable disorders, based upon the statistics of the medical examiner's office.

The subject of sex hygiene was particularly explained in the lectures on venereal disease, given to men and women students separately, and was the subject of especial personal inquiry, explanation, and teaching to each student at the medical conferences in the second semester.

MEDICAL CONFERENCES

Instead of making use of the required visit to the medical examiner in the second half year for a routine repetition of the physical examination, this occasion was used to learn the degree to which the teaching in the department had obtained results in terms of student application.

During the second semester every student must report at the office of the medical examiners for a personal conference as to his or her manner of living, understanding of personal hygiene and health since previous date of record. This is perhaps the most valuable opportunity for teaching health habits and bringing home the relationship between personal conduct and health, that the University offers. The density of the ignorance of the boys and girls as to the elementary facts and functions of their bodies is astounding. Expression of gratitude for helpful advice and open-hearted discussion of personal habits, is the rule during these conferences, of which 4,497 were held. This was considered an integral part of the compulsory course in hygiene. The items taken up with each student at these conferences were made a matter of record, whether or not any additional notes were made of physical examination findings. (See Form D).

SANITARY CONTROL AND EPIDEMIOLOGY

The Assistant Professor of Hygiene makes himself responsible for the functions of university health officer and epidemiologist.

Water Supply. The water supply comes from a supervised watershed. The water is filtered and chlorinated, and there is regular chemical and bacteriological examination of water. Water is distributed in a closed system and is available through bubbling fountains at many points in the buildings. The type of fountains is open to some criticism, but as operated they are in the main safe from a sanitary point of view.

Swimming Pools. In the men's swimming pool, the water is continually flowing, the pool is emptied and scrubbed every Saturday. The water is chlorinated with lime three times a week, and the men are required to take a shower before entering the pool. The water used is the regular university supply and is kept at a temperature of from 68° to 75°F. The same requirements pertain to the small pool for the women.

Sewage Disposal. The sewage of the city is collected by sanitary sewers and runs into a septic tank from which it discharges into the inlet, and then into the lake.

Milk. The milk is pasteurized and comes from inspected sources, but for some reason, not fully understood, the University and the city enjoy an exemption from the requirements of the public health law of the state, so far as the labeling of grade, date and source of milk

FORM D

Medical Conference

NAME

SPECIAL NOTES

Date	1st Year	2nd Year	3rd Year	4th Year
Address—Present				
Since last exam.—Have you had colds?				
Cough? How long?				
With expectoration?				
Headache? How often?				
Constipation				
Drugs to relieve?				
Tonsilitis?				
Present weight?				
Sleep?				
Open windows?				
Recreation?				
Exercise? Daily? What?				
Is appetite good?				
(1) Are meals regular? (2) Adequate?	(1) (2)	(1) (2)	(1) (2)	(1) (2)
How long at table?				
When do you brush teeth?				
When do you bathe?				
Are your gym. clothes clean?				
Hours pay work per day.				
(1) Hrs. credit per week. (2) Study				
Mental Reaction				
Sex Hygiene				

is concerned. Bacteriological examination of the milk as delivered is not used to check the quality of the supply, and the occasional souring of milk as used in the clubs and cafeterias, even in cool weather, suggests that the quality of the supply is below safe standards.

Ventilation. The ventilation of lecture halls, laboratories and eating halls leaves much to be desired, and will continue to be poor until an instructed janitorial service is established which will maintain standards to be proposed by the Department of Hygiene, replacing the control or neglect of room ventilation by the teachers of the University. Neither temperature nor air movement meets the minimum requirements for the students in class rooms and laboratories, with rare exceptions.

Flies. There is no nuisance from stables and flies in or near the university. Screening of kitchens and dining rooms during fly season is fairly complete. A good grade of stable housekeeping prevails within university grounds and on the farm.

Common Cups and Towels. Common cups and roller towels have not been found in use within the jurisdiction of the university, and their use in public places is forbidden by local sanitary law.

Cafeterias. The cafeterias do not in all instances as a routine boil the eating utensils after use, although soap and hot water are used as in ordinary household practice. The passing of all eating utensils through boiling water for five minutes after they have been washed with soap and water and rinsed, would probably diminish the incidence of diseases spread by saliva and discharges of the upper respiratory tract. This procedure has not been enforced as yet.

Certain disadvantages are apparent in the cafeteria system of food supply. The self-serving prevents the intervals of waiting, which are conducive to good digestion. Conversation is reduced to a minimum with consequent loss of that accessory of eating so desirable for the development of effective digestive juices, namely laughter and good fellowship. The food is of excellent quality, well prepared and of good variety. The chief error noticed in the selection of food by students is their failure to give to fruits and green vegetables, cooked or as salad, their proper place in a mixed diet. Rapidity of eating and altogether too short a time spent at table for all three meals are prevailing and unhygienic habits. A dietitian of the University supervises the selection of cafeteria dietaries.

Living Conditions Away From the Campus. No systematic inspection of living rooms and dormitories has been attempted. Overcrowding does not exist. Adequate water facilities for bathing and for toilet use are available. Heat is supplied sufficient to meet all reasonable needs. There remains the element of fresh air where the students sleep, or study in their rooms, and it is evident from inquiries that the open window is not as universal as is desirable. Education rather than inspection is thought to be the best way to correct the indifference of young, healthy people in this direction.

Administration. Authority over physical education is vested in the Professor of Physical Education. Authority over sanitation of environment, control of disease, medical examination of students, instruction in hygiene and preventive medicine, and medical care for minor ailments are vested in the Professor of Hygiene and Preventive Medicine. The care of the sick is under the direction of physicians employed by the students and only when this care is at the infirmary is there even a general supervision of the quality of service provided.

The two departments above mentioned are included within the University Faculty, as distinct from the faculties of the component colleges of the university, and their functions are in large measure to carry out the policies required for the physical well-being and protection of the

whole student body. There is friendly coöperation between the Graduate Director of Student Athletics and the departments of Physical Education and Hygiene and Preventive Medicine, and among these three and the Army Officer in charge of military drill.

The final authority in sanitation of university premises is considered to rest with a committee of the Faculties including a sanitary engineer, a physician and an executive officer of the President's office. The Assistant Professor of the Department of Hygiene and Preventive Medicine is considered to be the responsible inspectorial and critical representative in sanitary matters. The enforcement of sanitary standards in the watershed, and in general in the grounds and premises of the University rests with the superintendent of buildings and grounds.

Research. The research work of the Department of Hygiene and Preventive Medicine has been confined to the field of statistical study of morbidity reports, to obtain a basis of fact and comparison for results of the measures of control, examination and education employed. Immediate use of current morbidity data has been made throughout the lecture course, to point the lesson of personal responsibility for preventing and controlling preventable forms of sickness.

The four groups of diseases which have been particularly followed and from which material has been drawn to stimulate interest in self-protection and in unselfish protection of the group have been: the communicable diseases, scarlet fever, measles, mumps and whooping cough.

The respiratory tract affections, including colds, grippe, coryza, rhinitis, tonsillitis, pharyngitis, laryngitis, tracheitis, bronchitis, pneumonia and pleurisy.

The communicable diseases of the skin. The diseases of the digestive tract.

These have been studied by sex, by month, by total incidence and by numbers of days lost.

CONCLUSION

It is the belief of those responsible that with modification in the educational methods to permit of employing the recitation as a means of explaining and discussing the subject matter of lectures and text books, by the grouping of students by sex and college to permit of more direct appeal to group needs and interests, and by the placing of the college infirmary and the practice in it under the direction of the Department of Hygiene and Preventive Medicine for administrative and clinical purposes, the plan of student education and protection as above described can be made to provide a valuable health asset to the students, to the graduates and all who come within their sphere of influence.

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Chillicothe, Ohio, is a city in which the Board of Health has issued a regulation that all milk sold in the city must be pasteurized by an acceptable method or must come from tuberculin-tested cows. Those who supply the milk are given until August 1, 1921, to prepare themselves for compliance with this regulation.

Chillicothe has already a regulation whereby workers in bakeries are among those subject to a physical examination by the Health Department. A medical certificate will be required of every employee, and employers will not be permitted to employ a person who does not possess this certificate. The city Board of Health has furthermore decreed that hogs shall not be kept even within the extreme city limits.

SYMPOSIUM ON HEALTH SUPERVISION IN COLLEGES

II. SUPERVISION OF HEALTH IN COLLEGES AND UNIVERSITIES

JOHN SUNDWALL, Ph. D., M. D.,

Professor of Hygiene and Director of the University Health Service, University of Minnesota, Minneapolis, Minn.

Read before Session on Personal Hygiene, American Public Health Association, at San Francisco, Cal., September 15, 1920.

IT IS my purpose in presenting this subject, the supervision of health in our colleges and universities, to show the relationship that it may have to the community health. I realize fully that this meeting is a gathering of workers from all the various public health activities and that wherever it can be shown that the aims and activities of health supervision in colleges and universities are applicable to general health work, this should be done.

With a view of emphasizing this relationship, I feel that a few words concerning the present trend in public health interests and activities will be of value before taking up the specific duties of university supervision.

PAST PUBLIC HEALTH ACTIVITIES

Prior to the World War, our chief public health activities were confined to the control of the environment. If typhoid fever "broke out" in a certain locality, the sanitarian was sent out with a view of making an inspection of the premises concerned and directing the people to clean up. If diphtheria became rampant, the schools were closed early and the schoolhouses received the usual innocuous fumigation. The general assumption was that germs of disease lurked in dark rooms or filthy alleys patiently awaiting the innocent passerby with the determined objective in view of "jumping onto him." Such was our belief of disease in general and of tuberculosis in particular. Further, it was commonly held that diseases traveled a long distance through the air. The term malaria, which means "bad air," illustrates this belief. Hospitals for infectious diseases were located at some distance from the city.

Therefore, we legislated against and made provisions for the control of the environment. Restrictions were made as to the location of slaughter houses, pig sties, corrals, etc. Health laws and regulations were in general concerned with street cleaning, garbage disposal and the abatement of nuisances. Water purification and sewage disposal received consideration. The public roller towel and the drinking cup fell within the ban of the health department.

Then we "set up" state and municipal boards of health and proceeded to hold them responsible for our health. If an epidemic broke out the invariable public reaction was: "What is wrong with the health department?"

On the whole, we had become more or less satiated with the apparent success of our health activities. We expended much money and each state, municipality and district in our country possessed a board of health that would "see to it" that health was equally disseminated to all our citizens. In fact, we openly boasted that America was a nation of super-health and strength. Did not our American youths return from the world's Olympics wearing the laurels of victory? Are not the world championships in boxing, wrestling and in a host of manly sports held by Americans? What better specimens of active and virile manhood can be presented than the football eleven? Assuredly such evidence bespoke a nation of unrivaled physical vigor.

THE NATIONAL DELUSION

Wars have their virtues in that they make the nations engaged therein conscious of their own weakness. Perhaps our greatest national delusion was dispelled when we began to muster in the man power for our armies. For the first time in the history of our country a far-reaching health census was taken, the draft examination. "One-third failed to pass the physical examinations." Under this caption was heralded the humiliating results of the nation's first attempt to raise an army. One-third of the very prime of American manhood failed to pass the ordinary tests of physical fitness. No attempt was made to select supermen.

Previous to this forceful and lamentable discovery of our general national physical retrogression, however, numerous warnings had appeared from time to time. Infant welfare workers had called our attention to the hazards of babyhood. More than 300,000 children under five years of age die annually in the United States. And the majority of these deaths are preventable. Such then is our reckless wastage of infants. Educators had warned us repeatedly of the deplorable physical condition of school children. Of the 22,000,000 or more of our public school children, 16,000,000, or 75%, have physical defects which are potentially or actually detrimental to health and efficiency. Life saving agencies had informed us that as the middle period of life is reached, a sound physique was a rare finding. But we took little heed. It required the war to make us realize the seriousness of our deplorable condition.

Thus a national delusion was dispelled.

THE PROMOTION OF HEALTH

What then was wrong with all our past expensive and energetic health activities? We had dealt chiefly with things, environment. We had failed to deal intensively and extensively with the person or people. Ignorance of the fundamental laws of right living and its invariable accompaniment, neglect of the body, are responsible in the very largest measure for this present national problem. Hereafter the education and control of the individual will be the foundation of all effective health work.

Education of the people is the only means a democracy has for the correction of this evil. The promotion of health is fundamentally an educational matter. Every citizen must be potently impressed with the urgent need of building up and maintaining a strong, healthy, harmoniously developed and active body; and to accomplish this he must know the role that food, air, activity, rest, poisons, physical defects and mental instability play in impeding or promoting health.

No country can maintain a position in the vanguard of civilization if its citizenry is made up of subnormals. The individual must be made to feel that positive health is fundamental to his own welfare and to the permanency, security and advancement of our nation.

Nor must this education be delegated to some more or less obscure feebly supported health agency. It must be an integral part of our educational system. The promotion of positive health must be of greatest concern to all interested in the welfare of the state. We must no longer tolerate that ignorance and neglect which imperils the nation in times of great crises. We must have young men physically able to support the supreme obligations of citizenship when the very existence of our country is dependent upon its man power. Thus good health becomes a question of patriotism.

Further, society is going to concern itself more and more with the subnormals. The physically and mentally defective are millstones tied to the neck of society. They are economic burdens. It has been estimated that at least one-half of our American people who should be economically productive are not "holding up their full end of the burden" because of preventable subnormality, and are being

supported wholly or in part by the other half which is industrially active.

Assuredly, the promotion of health is an educational problem. Like education, it must reach every individual.

THE PREVENTION OF DISEASE

Future public health activities will be concerned with two problems: the promotion of health and the prevention of disease. The two require more or less separate interests. No matter how strong and resistant the body may be, ingestion of sufficient numbers of virulent tubercle or typhoid germs will cause these diseases. The promotion of health is a personal matter. The prevention of disease is a community affair. It has already been shown that the promotion of health is primarily a problem of education. The prevention of disease is even more intimately related to education.

That there is an appalling annual wastage of human lives in America may be readily seen from the following list of principal causes of deaths in the United States for the year 1918, as compiled by the census bureau. It must be pointed out here that these figures show the mortality in only 77.8 percent of the population. To estimate the total number of deaths, each figure below should be increased by 21.2 percent, or approximately one-fifth.

In the death registration areas of the United States (77.8 percent of our population) there were 1,471,367 deaths for 1918. Because of influenza, the number of deaths for this year is higher than in other years. The number of deaths from the chief causes are tabulated as follows:

1. Influenza 244,681
2. Pneumonia 232,786
3. Tuberculosis 122,040
4. Whooping cough, Diphtheria, Measles, Meningitis 41,874
5. Diarrhoea Enteritis..... 59,109
6. Typhoid Fever..... 10,210
7. Dysentery 4,725
8. Degenerative diseases, including 240,889
9. Disease of the heart. 124,688
10. Disease of the blood-vessels 83,931
11. Disease of the Kidneys 32,270
12. Cancer 65,340
13. Congenital malformations and debility..... 63,375
14. External causes, accidents.. 82,349

This list of principal causes of death in the United States should be familiar to every public health worker. It shows us where we must concentrate our efforts. It helps us to discern between that which is most worth while in public health work and that which is not so important or essential.

Further, this list of the causes of death is so arranged that it shows the mortality due to diseases that are more or less preventable and, therefore, belong to those interests or activities which have for their object the prevention of disease, or community health. The first seven items, or one-half of the list, belong to this group.

The second half of this list, items 8 to 14, inclusive, gives the causes of death that are more or less due to ignorance and neglect on the part of the individual and, therefore, may be included within the realm of those operations which are concerned with the promotion of health, personal hygiene.

Of course, it is impossible to differentiate definitely between the abnormal bodily processes that are of community origin and those of individual origin. They overlap and are inextricably interdigitated.

It must be borne in mind that these figures show the actual deaths for approximately four-fifths of our population, due to diseases that are in the largest measure preventable. Just what a human life is worth in dollars and cents depends upon many factors. It is rather sordid to consider human values from a financial basis. However, economists

have endeavored, although unsatisfactorily, to ascertain the money equivalent of human life. Fisher computes the annual loss from deaths, in the United States, to be $1,070,000,000. This is based on an estimate of $1,700 for each life.

We must not forget that this loss is for actual deaths. The economic loss as a consequence of preventable diseases, which render the victims economic burdens, must reach several billion dollars. Assuredly the payment of our war debt would be an easy matter, if we could eliminate human incapacity, sorrow, suffering and poverty that are brought on by preventable diseases.

The prevention of disease is largely a personal matter and must be achieved through dealing with the person. How shall we proceed to deal with the person? Every responsible individual must be made familiar with this fact, that the majority of our serious communicable diseases are spread by contact infection, that is, spread from one person to another. It is the person infinitely more than the thing that must be feared in disease transmission. Social intercourse is responsible for at least 95 per cent of our communicable diseases. In other words, if you contract tuberculosis, diphtheria, or scarlet fever, the disease was passed on to you by some one else harboring the germs who had recently "crossed your path," and been in fairly close association with you.

Now if we look once more at the list of the principal causes of our mortality, we will find that influenza, pneumonia, tuberculosis, whooping cough, diphtheria, measles and meningitis claimed 641,381 people. These diseases, with scarlet fever, mumps, smallpox, chicken pox, common colds and tonsilitis and their complications are responsible for not far from one-half of our national morbidity and mortality. They are spread by discharges from the mouth and nose and depend in the largest measure for their transmission on direct contact infection.

It is precisely here where the community idea of health comes in. No community is healthier than its one or more infected inhabitants, disease carriers. A chain is no stronger than its weakest link. A social unit is no healthier than its loose tuberculous victim. One carrier of typhoid germs may be of infinitely greater danger to the community than failure to observe all the laws on our statute books regarding sanitation. Rigid enforcement of regulations pertaining to garbage removal, street cleaning, slaughter houses and a host of other sanitation measures, will do practically nothing to minimize the dangers of those diseases which are spread as a result of social intercourse. We have made but little progress with the control of those diseases which depend for their spread on human contact—venereal diseases, influenza, tuberculosis, pneumonia and others.

On the other hand, we have made great progress in the control of those diseases which are more or less dependent on "things" for their transmission. Plague no longer worries us because we have made and can make a successful war on the rat, when this disease threatens. Yellow fever and malaria are rapidly succumbing as the conquest of the mosquito progresses. Typhoid fever, cholera and other water-borne diseases are gradually being eliminated because people in general insist on and make provisions for pure water. Our great success in checking these diseases is due in the largest measure to efficient health agencies, for they can successfully cope with those diseases which depend for their transmission on factors other than people. When it comes, however, to the control of human contact infection, the health agencies' efforts are relatively of little avail because they must deal directly with man himself and the average man at present does not want to be regulated.

EDUCATION AND PUBLIC HEALTH

The control of the individual then, is the solution of our future health prob-

lems. Laws and remedies of one kind or another, even if good, are unworkable unless the people themselves want them. Only by the education of the masses in character and by leading them to realize the value of *positive* health and their individual responsibility in securing it for themselves and their community, can a society be developed that will be physically sound and that will effectively reduce and help to eradicate preventable physical defects and preventable diseases. All other methods will fail. Our greatest achievement in this matter will be reached when the desire for and methods of securing health become ingrained in the human consciousness. Each individual must be made to realize potently that the maintenance of positive health, a sound, active and vigorous body, is a sacred obligation he owes to himself, to his family, to his fellowmen and to his country; that he must maintain the highest degree of health so that he can carry on his share of the economic burdens, thereby adequately providing for his family and minimizing human unhappiness, misery and poverty; that he must remain free from disease so that his fellowmen may be protected.

When the majority in a community or district are well informed regarding the fundamental of right living, the promotion of health, and the sources, routes and prevention of communicable diseases, real progress will be made in that community in the promotion of health and prevention of disease, in public health—and not until then.

Education of the masses, then, becomes the chief problem and activity of the future health work. This education must be as broad and long as is that education which stands for good citizenship. It must be an inextricable part of our public school system, our colleges and our universities.

RESPONSIBILITY OF THE UNIVERSITY TO PUBLIC HEALTH

The university was established and is maintained as a guide of the people and an ally of humanity in its struggles for advancement. Since health is fundamental to the welfare and advancement of society, the responsibility of the university to the people in matters pertaining to health is a most important one. As the state university is, in general, at the head of the public school system of the state and from it radiate the substance and methods of general education for the masses, so should it be at the head of the health of the state.

Therefore, the university must make provisions for its study, teaching and advancement. It must determine through university methods what is worth while, and what should be taught in matters pertaining to the promotion of health and the prevention of disease. It must, through carefully planned, required courses, impress upon every student the fundamentals of personal hygiene and community health. Since the university is a community in itself, it must provide for a health center wherein the practices of health promotion and disease prevention can be put into effect. Further, it must arrange for the training of public health leaders and workers.

REQUIRED COURSE IN HYGIENE AND PUBLIC HEALTH

The most far-reaching and effective means by which colleges and universities can supervise students' health is the education of all its students in the fundamentals of health promotion and disease prevention. Every college can, and should, do this and it should be in the nature of a required scientific course in hygiene and public health for all entering students (academic credit to be given) wherein the fundamentals of health promotion and disease prevention are effectively considered. Only the essential facts in personal hygiene should be emphasized, such as nutrition, the balanced diet; air-ventilation; activity, need of exercise for the harmonious development of the body and for maintaining positive health; rest, amount and regularity of sleep and the avoidance of fatigue and

overstrain; bodily poisons, evacuation and elimination, focal infections and the role they play in producing bodily infirmities; defects, the avoidance and correction of such defects as the draft examination revealed; mental hygiene, conservation of the mind, mental efficiency, the prevention of neurosis and psychosis, the need of proper social adjustment.

The greatest stress in this course should be placed on the prevention of disease and on community health. After due consideration of the nature, source and routes of infection and the methods of blocking these routes, the student will readily appreciate that the health of every member of his social unit is of grave concern to him. For of what use is it to concentrate all health interests and activities on one's own body if at the same time, one's bed-fellow has active tuberculosis?

Then the student will be given a clear grasp of what is essential and worth while in community health work. He will be impressed with the necessity of every member in his community, taking frequent physical examinations in order to detect diseases in their early stages, and to discover defects. After all, it is the frequent compulsory physical examination (when the masses are educated it will no longer be compulsory, but voluntary) which will be the real foundation of genuine public health work. As man himself is the source of practically all our communicable diseases, the physical examination will discover the source. When the source is discovered, the carrier and disseminator of germs will be taken out of society and treated in the hospital until free from contamination. This is community health in a nut-shell. Had this been our past method of dealing with disease, would not the problem of tuberculosis now be settled?

Of course, the student will become interested in everything concerned with community welfare and health—housing, recreation grounds, working conditions, sewage disposal, pure water, wholesome milk and food. All these must receive their due attention in this required course in hygiene.

It is these students who later will become the teachers and leaders of men. Much may be expected for the advancement of public health through this source, wisely arranged and conducted college instruction in hygiene. In the wholesome fruits of the seeds that were sown in the colleges and universities are seen our sane state constitutions, our just laws, our sound educational institutions. Likewise, ideal public health activities in the future are in the largest measure going to be the fruitions of ideas sown in these required courses in hygiene and university health services.

COMMUNITY HEALTH CENTER, THE UNIVERSITY HEALTH SERVICE

The student who takes this scientific course in hygiene and public health will soon appreciate that 95 percent of future public health work is going to be concerned with the person, and that facilities must be provided for dealing with him. This will find expression in the Community Health Center. It is by no means visionary to state that the health center will be one of the most imposing of our public structures. At least it will be given the same housing consideration as is now given to schools and courts.

From the community health center will radiate all those activities concerned with the health of the community. It is here where the mothers will be taught the hazards of babyhood and the methods of salvage. School hygiene will emanate from and be closely related to this center. Even adults will gather for instruction in means and methods of promoting health and of preventing the defects and diseases that are prone to come on in middle life. This teaching must be concrete and well illustrated. Hence, nutritional, dental, tuberculosis, child welfare, mental and other clinics must be given from time to time at the community health center. Thus education of the masses in the theories and practices of

health promotion and disease prevention becomes the most important public health activity of the health center.

The health center will be our solution of social medicine. It must have in its employ physicians, laboratorians and nurses. Ample provisions must be made for physical examinations and physical records must be kept of the individuals making up the community. This is the bookkeeping of the community's health. Further, the health center must possess a dispensary where people with minor ills may come in for treatment. Hospital beds must be provided, both for the care of the general disorders and the isolation of sources of infection. Thus the health center will contribute much to the health efficiency, happiness and welfare of the community.

The sanitarian and laboratorian, with their equipment and facilities, will keep eternal vigilance over the water system, and the milk and food supply, and concern themselves with the environment wherever it is related to the health of the community—such as housing, recreation grounds, etc.

The University of Minnesota has established one of these health centers for its community of seven or eight thousand students. It is known as the Students' Health Service. During the school year 1919-20, the second year of its existence, more than 5,000 students had sought its services. Approximately 34,000 visits were made to the dispensary for physical examinations, medical consultation, advice or treatment. More than 1,400 cases were sent to bed and many of these were isolated because they were for the time being dangerous to the community.

These curative or treatment phases of medicine, however, are not the chief concerns of the students' health service. Its aim is to help each student entering the university to possess a healthy, vigorous, active and harmoniously developed body and to keep it at its best. It stands for positive health. It desires to be a most potent factor in reducing to the very minimum that prodigious annual economic and academic loss in our universities due to lassitude, indisposition, illness and frequent epidemics among students. Therefore, it is as much concerned with the physical welfare of the sound student as it is with that of the ill or the subnormal. The promotion of health and the prevention of disease are its watchwords.

Education here, as in all public health activities, becomes the chief instrument of effort. In fact, the students' health service may be rightfully regarded as the laboratory of hygiene and public health teaching in the university. For it is here where the student actually sees and experiences the practical application of his instructions. The health service augments the student's class-room instruction in health by means of daily health bulletins, special lectures, exhibits, placards, posters, etc., and the distribution of timely literature.

We believe that the future community health centers will be patterned in a large measure after the university students' health service and that they will be the best solution of what is now discussed as social or state medicine. Therefore, a brief summary of the organization, scope and facilities of the university's health center or service may be of interest here. The various activities of a health service are closely related. They can, however, be divided into three subgroups: 1. Education; 2, Personal Attention; 3, Sanitation. The education phases have already been sufficiently discussed.

Personal Attention. — Each student entering the university for the first time is given a rigid physical examination. This is done before he is allowed to register. The values of these physical examinations are inestimable, both from the personal and community standpoint. One of the greatest values of this examination is not so much the detection of existing disease and defects as is the assurance to a large group who think they

have disease and are subnormal that they are really sound. Fanciful ailments and imaginery defects are the contribution of over-solicitous parents and harmful literature on the part of pseudoscientists and charlatans. Those who are subnormal are presented with an inventory of their defects and means are provided for the remedies. Students who bring tuberculosis and other communicable diseases are isolated and treated. The physical record of each student is kept for numerous future references.

The activities which come within this sub-group of personal attention are:

1. Physical examinations and bureau of records.
2. Provisions and activities for the maintenance of health of sound students. Here the health service coöperates with the departments of physical education, intramural sports, recreations, etc.
3. Vaccinations and inoculations against those diseases for which we have specific prophylactic treatment.
4 Reclamation and reconstruction of subnormals.
5. Hospital and dispensary for the treatment of ill students.
6. Isolation hospital for care and treatment of communicable diseases.

Sanitation. — This subdivision concerns itself with the student's environment, both on and off the campus. Rooming and boarding house regulations must be enforced and frequent inspections made. The sanitarian must be especially concerned with the drinking water, swimming pools, the milk and food supplies and the health conditions of those concerned with the preparation and serving of food.

Finally, the laboratory serves both the personal and sanitation subdivisions. It makes possible the early detection of communicable diseases and provides facilities for the routine analyses of specimens.

The University Health Service, as it is now organized, serves two purposes. In the first place, it is directly concerned with its own community health problems. Secondly, it must be regarded as an educational measure of greatest importance. For it is here wherein the university is working out the problems of community medicine, call it what we may, health insurance, state or social medicine. No more far-reaching contribution can be made by the university than the solution of this intricate problem.

The training of public health workers and directors is going to be another concern of the university in the near future. Departments of hygiene and public health should be established wherever the resources and facilities will permit. The department should be concerned with giving that required instruction, already outlined, for all entering college students. Further, it should be concerned with the training of public health workers and directors. Even now the demands for trained men and women cannot be supplied. As the community health idea grows, the demands will increase. In fact, the opportunities for health workers in America will be second only to the teaching profession. The university must organize its resources so that this training will be supplied.

The supervision of health in our colleges and universities, to summarize, lies along the following important lines: Directly, in the education of all its incoming students regarding the fundamentals of health promotion and disease prevention and the establishment of a health center or service wherein the practices of community health may be put into effect. Indirectly, the supervision of health in our colleges and universities must re-act wholesomely on the nation at large through the influences the college student will have on his community in later life. Further, wherever it is feasible, the university and college should provide training for public health workers and through research and investigation add to our knowledge of health supervision.

SYMPOSIUM ON HEALTH SUPERVISION IN COLLEGES

III. STUDENTS' INFIRMARY, UNIVERSITY OF CALIFORNIA

Its Contribution to Student Health

ROBERT T. LEGGE, Ph. G., M. D.,
Professor of Hygiene and University Physician,
Berkeley, Cal.

Read before Session on Personal Hygiene, American Public Health Association, at San Francisco, Cal., September 15, 1920.

THE central idea of this institution is an insistence on individual health for the good of the many. It denies the privilege of any student through illness to constitute himself a menace and thereby deprive other students of the privileges of the university. The health of the student at the university is better protected than when he is at home.

The success of this movement was achieved by the unique combination of preventive and curative medicine. A compulsory course given by the Department of Hygiene in personal and public hygiene acquaints all students with the necessity for the control of infectious diseases, thereby eliminating, as far as possible, sickness as a cause of disability in university classes. Looking at it from an economic standpoint, one can readily see that the academic loss from poor class attendance would be materially minimized by such measures. With a dispensary and hospital service on the campus, the student is free to consult the staff for minor ailments and be treated before a more serious condition develops. With such an educational program, practically carried out in a university community, our students could not help carrying the message of preventive medicine to their own homes and communities, thereby constituting an educational measure which has an important influence on the development of public health.

To study the summaries for the year 1919-20 is to grasp the situation as to what is being done at this health center in the university. The number of students enrolled was 9,991 and out of this number 7,112 individuals, or 71 percent of the entire student body, received treatment at the dispensary on an average of five times, during which 140 patients were treated daily. For those who required hospital care the number of days was 5,765, of which 968 patients had an average stay of 5.9 days. The largest number in any one day was 71 and the yearly average per day was 21.1. These hospital cases consisted principally of respiratory and other infectious diseases, surgical and general medical cases.

To those unacquainted, it would seem that the numbers quoted were unusually large, particularly in such a young adolescent group, but the fact is that a large majority of these consultations meant prevention of disease rather than delayed cures and increased mortality. This also demonstrates the fact that the average person necessarily requires medical supervision. Every student is taught that when any evidence of illness is observed, reporting to the infirmary is essential, not only for the early treatment of the ailment, but for the safeguarding of his fellow students from a possible disease. Should the patient have a temperature over 1° C., he is hospitalized and placed under observation. The observance of this rule has often prevented contacts by early isolation, even before the classic symptoms of communicable diseases have appeared, a measure of epidemiological importance.

A complete physical examination, far more exacting than the recent United States Army examination, is a requirement for admission to the university. These examinations frequently make possible the recognition and cure of conditions of ill health which the candidate has not hitherto known to exist. Often,

too, it relieves the groundless apprehensions of students who imagine there is something wrong with them, when in reality they are well. How can any sane individual argue against physical examination when the advantages are so numerous; including the recognition of early infections, the identification of missed cases and carriers, the finding of incipient disorders and the disclosure of congenital and postural defects? For the most part, less than ½ of 1 percent of applicants have been denied registration. These were advanced cases of tuberculosis and mental disorders. These physical findings are carefully noted and the record is utilized should the student subsequently seek dispensary advice.

Much of the data is used by the Physical Education Department which carefully selects from these records items that concern the welfare of their students as, for example, heart conditions and correctable postural defects. The same physical examination is used for the R. O. T. C. candidates and for the Military Department.

It is of interest to note in comparing our present records of defects observed by making careful physical examinations, with the same data of five years ago, the marked difference and improvement which prevails. There are 50 percent less eye refractions to be performed, *otitis media* cases are fewer, and there are better and more tonsillectomized throats than formerly. So on the whole, the college entrant now is in better physical condition, due to the efficacy of medical supervision in our secondary schools.

The University of California desires to keep its students well; it believes in preventive medicine. The Regents require compulsory cowpox vaccination and no one is excused who does not possess a satisfactory scar which is accepted as evidence of his immunity. It is of interest to know that the number of students last year who required vaccination were 816 out of 3,258 new entrants. The State Board of Health, in a recent article, finds only 20 percent of California school children vaccinated and Dr. Force of the University of California has shown that in 1919 smallpox in California has increased in this group eight-fold.

Compulsory vaccination was adopted 14 years ago at the University Infirmary, and not a case of smallpox has been recorded in the infirmary statistics. The method employed by Force is a modified Von Pirquet. This method of vaccination was adopted by the Surgeon-General during the war. Notwithstanding the Appelate Court decision and the enviable record the university possesses, the "Anti-Vaccination League" has an initiative measure* (No. 6) to be voted on at the coming election. It provides that vaccination shall not be made a condition for entrance to schools and colleges of the state.

The staff of clinicians at our infirmary is composed of specialists in several fields of medicine. This makes possible the practice of group medicine. Each specialist has an interest in preventive medicine, and in the correction of defects. Modern public health measures are a matter of routine practice, to which members of our staff conform. For example: All throat cases examined are cultured and if positive for diphtheria the contacts are "Schicked" and the nonimmunes immunized. In measles, and acute respiratory infections, the patients are isolated and their throats cultured for *Streptococcus hemolyticus*. All positive cases are isolated, as it is known that these *Streptococcus hemolyticus* carriers are a menace to others. Students with an infectious or contagious skin disease are prohibited from using the gymnasium and swimming pools. Blood, sputum, fecal, and urinary examinations are made regularly when indicated, in all house and dispensary patients. In venereal cases Niesser infections are not dis-

*This initiative was defeated by a decisive popular vote.

charged cured until the prostatic secretion is negative for pus cells and gonococci. All luetics are given the benefit of frequent Wassermann tests. Infected tonsils, adenoids and correctable defects are operated upon. Constant observation minimized the incidence of focal infection. Focal infections are frequently the sole etiological factor in arthritis, endocarditis, nephritis, etc. Because of the importance of teeth as foci of infection, dental care was instituted six years ago and a prophylactic dental service is conducted here by two dental surgeons.

Among students treated at the Infirmary there have been only seven deaths over a period of 14 years. These statistics do not include the victims of the influenza epidemic. During the war the toll exacted among the S. A. T. C. was 13 soldiers and four nurses out of 1,400 cases treated by the United States army and university staff.

The foresight of the University of California in prescribing a compulsory course in Hygiene for all new entrants, made it possible to control communicable diseases on the campus. This course is given by the Professor of Hygiene, who is also University Physician, which makes it possible for him to present the medical as well as the public health aspect of the subject. Only too often hygiene in other colleges is linked up with physical education which limits itself to bodily development, recreational activities and corrective functional postural defects. Physical education alone does not take into account the processes of immunity in disease. Body resistance and physical development are not synonymous. The organized Infirmary system makes for great alertness in the detection of contagion; its facilities for bacteriological and clinical examinations, the use of immunity measures, and the hospitalization of communicable diseases by the practice of medical asepsis, according to the principles advocated by Chapin, together with the educational influences, combine to produce a public health program which protects our student body from infectious diseases. Missed cases and carriers are more readily detected, isolated and treated under such a system.

Educators and university medical officers have from time to time made inquiries as to the prevalence of venereal disease among college students. The incidence of these venereal diseases has been reduced within the student body due, undoubtedly, to the teaching of hygiene, self-control, physical education and to prohibition, all these tending to higher moral attainment. Only 11 cases, or practically 1/10 of 1 percent were reported for the year 1919-20. While it is true that prophylaxis is admitted to be the public health measure in the prevention of venereal disease, yet advocating the same is considered as countenancing license to immoral behavior. The subject of prophylaxis should be presented by quoting to the college students the results accomplished by the army authorities during the war. It is of interest to know that as all these cases gave history of contact, yet 40 percent were nonspecific urethritis, as determined by smears and cultural methods.

Personal hygiene, as it is theoretically taught by the Department of Hygiene and practically applied in our gymnasium and military department, is of inestimable value to our students. Physical education not only develops and promotes bodily functions, but it bestows educational, moral and spiritual advantages. The well-exercised man, trained to perform all the agility tests, is more likely to become a lover of true sport; he plays the game fair in life, and is less tempted to immorality. With the saloon and the commercialized red light districts abolished, the way is paved for a victory over social evils, for recreational activities must be developed by municipalities and educational institutions for the benefit of American youth. Play is a public health agency and the enemy of viciousness.

In our university, where a properly equipped dispensary and hospital is maintained, splendid opportunities are offered to study and observe among groups of intelligent persons, problems that are of immense importance to medicine and public health research. Blood pressure studies will, in the near future, be published by Alvarez. Recently an article was published by Kofoid and Swezy upon the incidence of carriers of amebic dysentery among students formerly with the American Expeditionary Forces of the United States Army.

McVey in his comprehensive studies on the treatment of chronic amebic dysentery cyst carriers has contributed valuable knowledge to the science of therapeutics.

By the application of public health measures with the practice of scientific medicine it has afforded in an academic community excellent opportunities for research and a promising field for the study of socialized medicine.

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SYMPOSIUM ON HEALTH SUPERVISION IN COLLEGES

IV. DEPARTMENT OF HYGIENE AND PUBLIC HEALTH AT THE UNIVERSITY OF KENTUCKY

P. K. HOLMES, A. M., M. D.,
Head, Department of Hygiene and Public Health,
University of Kentucky,
Lexington, Ky.

TOO long have the heads of our colleges and universities considered education as solely that of forcing facts and ideas into the minds of boys and girls. With this done, they have assumed an air of complaisance and satisfaction in their accomplishment. Little concern has been felt as long as their charges have been able to get out of bed, take three meals a day and attend classes. No responsibility has been felt for those whose general efficiency is lowered one-third or one-half by ignorance of the laws of proper living. Absence from class has been considered inevitable and accepted accordingly.

We are beginning to wake up to the fact that an educational system that considers the care of the mind only is not complete; that this often means an inability in after life to utilize fully the limited equipment received in college. A new meaning to education is coming to the more far-seeing educators and this is in the form of some appreciation of the value of physical education. As yet, this appreciation is but slight on the part of the great majority of educators. They have little knowledge as to what physical education is and what its aims are. Many believe that a student who works all day on his feet in a closed machine shop manipulating machinery is doing that which is equivalent to class work in the gymnasium which, of course, is absurd.

The various colleges of arts and sciences require a minimum of 120 hours of mental education for graduation, yet they begrudge four to six hours added to or taken from this 120 for graduation, for

education of the body. These educators forget that Greece, during her period of greatest efficiency, required more than one-half of the time of the school boy and girl for the education of the body.

It is very encouraging to note that our most progressive educational institutions are now making provision in their budgets for departments of hygiene. It will not be long before parents will refuse to send their boys and girls to institutions which do not make adequate provision for their training in health habits and for meeting all their health emergencies.

The institutions of the South have been more backward, perhaps, than institutions elsewhere in this matter. Through the help of the Interdepartmental Social Hygiene Board at Washington, many institutions have been made able to establish departments of hygiene. This plan has thus been made possible at the University of Kentucky. Prior to the organization of the Department of Hygiene and Public Health last September, medical aid of only a very casual nature had been available for the students.

The personnel of the new Department of Hygiene consists of the director, whose duties are those of organization, teaching hygiene, writing and conducting the state extension work in hygiene and physical education; the resident physician for men, whose duties are those of making physical examinations and giving medical attention to the men students; the resident physician for women, whose duties for the women students are similar to those for the men; the resident nurse, who attends to the girls in the dormitories and assists the resident physicians in their dispensary work, and the secretary, who attends to the clerical work of the department.

Beginning with next year, all students in the College of Arts and Sciences will be required to take a course in general hygiene, two periods a week for one year, for which regular academic credit will be given. This may be taken any time after the freshman year. All freshmen of the College of Arts and Sciences will be required to take six or eight special lectures in such fundamental principles of hygiene as will be necessary for proper adjustment to their new environment.

The students of the Engineering College will be required to take general hygiene once a week during the freshman year for credit. A similar requirement will be made of the students of the Law and Agricultural Colleges. This work will consist of lectures, textbook assignments and the writing of papers upon special topics.

A special course in School Hygiene, two hours a week during the first semester, and a course in the principles of Physical Education, two hours a week during the second semester, will be required of all students planning to teach. These courses will be elective for others.

A course in First Aid and Emergencies will be offered as an elective, two hours a week for one semester, with separate sections for men and women, to be repeated the second semester.

A course in Home Nursing will be offered as an elective, one hour a week for one semester, to be repeated the second semester.

The course in the Theory of Physical Education will be supplemented by a course in practical work given by the Department of Physical Education.

A dispensary is maintained on the campus in charge of the resident physicians and nurse. The dispensary is open all day for the convenience of the students and faculty. Medicines and drugs have been dispensed free of charge. A small fee will be charged each student next year in order to help pay expenses. As the work of the Department is chiefly preventive, the resident physicians cannot assume the responsibility of caring for cases of serious illness upon the campus or elsewhere. Such cases will be referred to local physicians. In response to a letter from the Department most of these physicians have gladly con-

sented to treat students and charge them according to their means to pay, providing the Department sends a statement with reference to financial ability. The dentists have also offered similar service.

A small infirmary has been established in each of the girls' dormitories. These will be in charge of the resident nurse.

Medical examinations have been made of every student in the university. An effort will be made to have another made at the end of school. The time taken for each examination is from 20 to 40 minutes. Special records are made of the findings at the examination. A card is sent to the parents stating the results, with a request to have existing defects remedied. A duplicate card is given to the student himself. With the card sent to the parents is enclosed a general letter stating the aims of the Department in its relation to the welfare of their boys and girls. Students with defects are required to report at the clinic periodically as a follow-up measure. In case of defects that cannot be corrected at the clinic, the student is sent to the local physician of his choice with a card signed by the resident physician stating his financial circumstances, etc., when this physician is one who has agreed to treat such students according to their means to pay.

The Department of Hygiene and Public Health is attempting to extend its work beyond the campus through the agency of the Department of University Extension. An extension center has been established at Frankfort, the capital of the state, and two others are about to be established elsewhere. At Frankfort all the city teachers will be required to meet once a week for a two-hour period of instruction in Hygiene and Physical Education. Here the expenses will be paid by the city School Board. Two correspondence courses in Hygiene and the Principles of Physical Education are offered, one for high school and one for college credit.

An article upon some interesting phase of health education is prepared each week and sent to the leading daily and weekly newspapers of the state. A series of engagements has been arranged for presenting health subjects at the various women's clubs over the state. The department is working in close connection with the state director of hygiene and physical education and the secretary of the state board of health.

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Health Education as an Economic Procedure in South Africa.—At Johannesburg, the local insurance companies have taken up the question of public benefit, and the Rand Mutual Assurance Company has deemed the public health education of the miners to be a business asset. A little pamphlet, "Your Health and How to Keep It," embellished with striking electrotypes from American sources, presents a series of health talks by A. J. Orenstein, M. D., Superintendent of Sanitation of the Rand mines. This volume is the more interesting since it was into this section that Surgeon General Gorgas was invited to go in order to discuss general sanitation with the authorities. Dr. Orenstein's book follows quite closely the American models, and intersperses advertisements liberally with the text. It discusses general diseases, describes immunity, shows the danger of the house fly and the common towel, speaks of some special mine ailments, decries patent medicines, emphasizes care of the teeth, presents reasons for safety first and carefulness, suggests healthful practices in food and water to drink, dwells for a moment on the benefit of sunshine and of exercise, and in a little book of 60-odd pages outlines a very sensible short course for health education.

SYMPOSIUM ON HEALTH SUPERVISION IN COLLEGES
V. MENTAL HYGIENE AND THE COLLEGE STUDENT

FRANKWOOD E. WILLIAMS, M. D.,
Associate Medical Director, National Committee for Mental Hygiene, New York City.

Read before the American Students Health Association, Chicago, December 31, 1921.

PHYSICAL health cannot be an end in itself. We would seem to lose sight of this at times although we tacitly admit it at all times in our failure to esteem highly those about us whose only claim to distinction is an exceptional physical prowess. Physical health can only be a means to an end. Longevity can scarcely be that end, for longevity of itself can be of no importance—it is the quality of a life that counts. The end we all probably have in mind as the chief justification of our work is that in increasing health we are making possible an increase of individual happiness and efficiency; and by efficiency we no doubt mean not merely economic or industrial efficiency, but ability in meeting personal problems of whatever nature. But happiness and efficiency are but partially dependent upon physical health. Of all the unhappiness that you and I may have had during the year that is now just closing, how precious few of them have found their source in ill health! How many of our failures and inefficiencies, little and great, can we honestly say were due in any large part to poor physical condition? Or how much happier do you conceive we would have been, or how much more efficient, had our physical health been tenfold better?

I do not, of course, minimize the importance of physical health. Had serious epidemics been abroad in the land, or had our physical health, because of ignorance or indifference or carelessness, been not what it was, our unhappiness during the past year would have been increased many times and our efficiency greatly lessened. I would merely point out that if our goal in public health work is essentially to increase human happiness and efficiency in a positive way, we are likely to miss that goal if we act upon the belief that it is to be attained through physical agencies alone and continue to ignore the fact that happiness and efficiency are essentially dependent upon mental factors.

Colleges and universities have been slow to recognize in any practical way the importance of physical hygiene, although the fact that this meeting is possible is evidence that faculties are beginning to see that it may be worth while to look after the health of students while these students are yet well. It is extraordinary, however, that universities whose function it is to work with the minds of students should still attend so little to the mental health of those students, although reasons for this neglect may not, after all, be so difficult to find.

If some have felt that happiness was dependent upon physical health there have been others who have felt that happiness was dependent upon intellectual development. Educational systems have been built largely upon this assumption—train the intellect and school the will that they may rule over the "baser animal parts." It is upon this that schools and universities have been engaged. Intellects have been trained in great number and the result in increase of knowledge has been very large. A child in the grade school of today has more information than had Aristotle. But with it all we find ourselves little nearer the goal. Much as it may injure our self-esteem to admit it, we are forced to doubt that happiness and efficiency are rooted in intellect. It fills us with pride to think that our lives are controlled and directed by the forces of our intellects—thus as human are we different from the animals. Unlike the animals, when faced with a

difficult problem, we gather together our bits of information and apply cold reason to the formation of our judgment. Although each of us occasionally may wish we had a little more "brains" to apply in making a judgment, we are quite sure that it is the "brains" (intellect) we have that are applied. But we largely fool ourselves. If we will ground our pride, I think we will find that all too often our decisions are quite largely made before our intellects come very fully into play and that our intellectual processes perform the function largely of finding reasons to justify the already made decision. In other words, our decision has been made upon an emotional basis rather than upon an intellectual one; the control and direction of our lives lies here, and what we each need is not alone more "brains" but a larger conscious control of what "brains" we have. If intellect controlled our destinies, most of the great problems of the day could be very soon settled; but, as we know all too well, intellect, in its relation to these problems, is largely used for balancing, countering, and compromising conflicting emotions. We know, also, quite well that this is equally true in the problems of our individual lives. The application of the "dry light of reason" alone would soon resolve most of our problems, but this dry light has a limited opportunity, for few, if any, of the fundamental and controlling interests of our lives and the problems that arise from them are alone intellectual.

There are other reasons why universities have been indifferent to the mental health of their students. Mental ill health has meant to them mental deficiency (feeblemindedness) or mental disease (insanity), and of the former there is none to be found in universities and of the latter only an occasional case. Mental hygiene, therefore, cannot be an important problem for them. This, however, is a misconception. Mental hygiene as a movement has had to concern itself very largely with the problem of the care and treatment of the great body of helpless sufferers ill of frank mental disease and with the social and economic problems that develop about them; but mental hygiene as a department of medicine is vastly more concerned with the mental health, the happiness and efficiency of the average normal person, of you and of me, of our wives and our children and our neighbors.

Then, too, mental hygiene seems a vague and intangible thing. It is still surrounded in the minds of many with superstition and mystery. A cat may look at a king and we no longer call it *lese majesty;* we may admit a belief in the science of modern biology and not be termed sacrilegious. Both terms have largely lost their force today, but the noisomeness and fearfulness that once surrounded them have not gone out of the world, and if we refuse a worshipful attitude towards intellect and turn our attention towards emotions, while the once fearful words will not be applied, much that once went to make those words fearful is likely to settle about. Men fear most, of course, what they know least about. We may feel safe in speaking of intellect—moral connotations have been stripped away; we may even glow with pride in speaking of will—the will has always been a moral agent; but the emotions have always been a "poor relation," and not only a "poor relation," but a "poor relation" that has done time in the workhouse, whose ancestors were all bad. Men in his line have been hung for murder, and it is reported that they have not always had a proper attitude towards women. He is animal-like and low, and, if we cannot deny him, we can make a pretense of ignoring him. This will at least help us to differentiate ourselves from his line.

Except for contagious diseases, the lack of helpful information is probably no greater in the field of mental and nervous disease than it is in any other field of medicine; and ignorance, as an excuse for fear, is no more justified here than

elsewhere. Let us for a moment look into the situation of the college student to see, first, if the problem of ill health is one that we need be concerned about, and, second, if there exists a body of knowledge that may be of help. Let us review some of the immediate problems with which the college student finds himself, the tools he has at hand with which to meet these problems, the solutions he is likely to discover using such tools, and the possible consequences of those solutions.

Decisions for the first time rest with him. He has been quite ready to make decisions for some time and has frequently been piqued that more liberty has not been given him in this regard. Decisions, he figures, are easy to make. One needs merely to know exactly what one wants and to move directly towards it. There will be slight distractions, to be sure, but with a clear purpose and a will to succeed, there should be no real difficulty. One must distinguish sharply between right and wrong. The counsel one has received in one's youth need not, to be sure, be the final word, for times change. In the newer situations one must use one's own judgment, but there are certain fundamental principles that should be adhered to. These principles are largely axiomatic, are world-old, and, therefore, are to be depended upon. One should be honest with one's self and with others. This should really not be very difficult. One should be sure of one's motives. One must credit others with equally good motives. It is probably true that there are people who are not honorable, who cannot be wholly trusted; but the number is probably not nearly so large as has been supposed, particularly among educated people. If one is fair and straightforward, others will be equally fair and straightforward. One should be frank, friendly, and generous. And one must be open-minded. One must not be easily discouraged. There are bound to be periods of discouragement and failure, of course, but one can always learn from one's failures and make them stepping-stones to better things. The thing will be to find out just why one has failed and see to it that it doesn't happen again. Thus courageously, if naïvely, the student starts out to add to his store of knowledge, and, in all good faith, to prepare himself to make the world a "better place because he has lived in it."

Somewhat to his surprise he soon finds that he is not called upon to meet the larger issues he was prepared for. There seem to be no moral dragons to slay. It is all so much simpler than he expected. As he had rather suspected, his friends at home have been over-solicitous; but that, of course, is natural, for it is impossible for them to know what college life is today, and they have never fully understood him or had the confidence in him he has deserved. One wishes one might be tested a bit more, that more important issues might be at stake. The problems one meets are petty and unimportant, merely troublesome, such as the distribution of one's time. How much should one "bone"? There is, of course, more to college than just books. One should mingle with one's fellows; one must have recreation; and one should be interested in athletics, even if one does not take part. One should be a supporter of all that is best in college life. How soon should one begin to specialize? Is one justified in giving more time to a subject in which one is particularly interested and for which one has a bent—as, for example, literature—or should one school one's self by forcing one's self to give time to a subject for which one does not seem particularly adapted, as, for example, mathematics?

Is it really dishonest to falsify slightly one's monthly account home? If a true account is given, it is likely to make the folks at home a bit unhappy; but when things are really all right, is one justified in causing this unhappiness, when it is

due not to the situation but to a misunderstanding of the situation?

There are so many odds and ends of things hanging about undone. How does he happen to forget these things? How did they get done at home? He cannot remember that he was even very much aware of them before. None of them is important, but collectively they are annoying and troublesome. One should have system and organization, but all his systems seem to get too complicated and his organization is always being upset by extraneous circumstances.

Without knowing it, he misses affectionate attention and, restless, goes about looking for something he cannot find. He finds himself but one in a crowd and there arise the problems of mingling with the crowd, of losing one's identity in order to find it; the problem of making and keeping friends; adapting himself to fraternity or other group relationships. Gradually philosophical doubts or social and economic doubts begin to assail him and he finds himself afloat on a sea of troubles. Anxious and concerned, he throws out anchors of axiomatic truths that had been forged for him, but they drag or snap. If he does not lose entirely and from thence on float about a dangerous derelict, he will likely find eventually quieter waters, but with the marks of his combat deep upon him. Permeating the entire situation, there will be not one but several sex problems to bother him.

As the student in the midst of his new complexities begins to take account of himself, what does he find? Although he has always been rather pleased with his self-assurance and ability to meet and mingle with others, he may find himself surprisingly awkward and embarrassed in the crowd. He has always enjoyed the society of others, has been, in fact, more or less of a leader at home; but now he finds himself filled with a strange self-consciousness and an embarrassment in trying to express himself. In fact, he does not express himself, not his real self. His new acquaintances, he is sure, are getting quite a wrong impression of him. They think he is inclined to be fresh when he has no desire to be fresh; or they think his ideas and opinions are unimportant when he knows they have value. He is sure he is better than a good many of those about him, but some seem to be getting the idea that he need not be considered. He is sure they are not getting his true measure. He is surprised at a lack of facility for making friends. He does not wish to be a hail fellow well met, but he would give a good deal to be able to learn to know people as readily as some of the others do. He knows he is capable of very deep friendship. He has a high ideal of friendship —nothing is more real than a true friend; there is nothing he would not do for a friend. But no one seems particularly interested in having him for a friend. How does one go about making friends? He is very much attracted to people who seem quite indifferent to him. When he joined the fraternity (or when, with a group, he decided to stay out), he thought this problem was solved, for he never liked a group of fellows more, particularly the older men—was there ever such a fine lot? And to be not only a friend but a brother to these men! But now, as things have settled down for the year, they do not seem to pay much attention to him. In fact, some have been quite disagreeable. He does not seem to fit in.

He has an opportunity to compare himself with others, such as he has never had before, and the comparison is not always in his favor. In his former small group he may have shone as an unusually good student; or he may have had facility for some particular subject, so that he excelled. Here he finds that there is nothing exceptional about him at all. In fact, most of the students in his classes have as good minds as he, and many far outclass him. Indeed his ability seems quite ordinary. He no longer takes pride in any special facility—there are quite too many who are far cleverer than

he, in what he thought was his own field. From this and from other comparisons, he becomes aware of what he believes to be an inferiority. This may be increased in the gymnasium, where he may find that his physical development does not compare well with that of others—he was not aware of this before; he had considered himself as sturdy and as well-developed as the average fellow. But this reminds him of some habits of his and he recalls how upon starting this new life among men he was going to be through with those habits. It would somehow be easier; in fact, it would be quite easy. But he hasn't changed; he is just as rotten as he ever was. No wonder he looks like a wart besides these fellows. How disgusted they would be if they really knew! Of course, manly chaps like these have never had such habits. They are men of strong will. He is different and really hasn't any right to be around them.

But if he finds himself inferior, he is generous enough to be glad that there are real men in the world—men of brains, men of integrity and men of strong will. He finds them about him. He places them upon pedestals, glories in them unselfishly, and in his humble ways tries to be worthy of them. And all too soon he finds his heroes have hideous feet of clay. In the classroom he may find both intellectual and emotional stimulus. Warmed by the enthusiastic discussion of a professor in classroom, he seeks him out in the quiet of his study, for he has seen a light and must know more of this. What he expects to find he himself probably does not know, but vaguely there is a feeling that professors who glow in the classroom glow at all times. He finds the professor more or less just human and probably a bit bored. In his shock and disappointment, he puts him down as considerable of a faker; as an actor who has no real interest in his subject, but who for classroom effect screws himself into an emotional enthusiasm he does not feel.

He finds himself strangely moody at times. Neither especially happy nor sad, but stirred by a vague discontent and restlessness. Spice and zest seem to have gone out of things. He is indisposed—he is probably just lazy, he thinks. Or things may take quite another turn and instead of vagueness there may be unaccountable floods of emotion that pass over him and puzzle him. But whether the puzzlement is from one source or another, he finds his attention distracted and work becoming more and more difficult.

He is distressed by a strange new attitude he finds developing towards his family. He has come to the time when emancipation from the family, the breaking of bonds that hitherto have held and limited him, is necessary. But he does not know this except vaguely. He knows that the family bothers him; he wishes they would let him alone. They mean well, but they do not understand either him or his problems. In fact, they never have. What are relatives anyway? After all, why should one "love" one's parents? One's parents are a fortuitous circumstance. One has a right to one's own individuality, and the development of individuality may demand getting rid of all fortuitous baggage and assembling about one's self those things and those people who best express or best call out the larger things in one's personality. At any rate, "love" and "affection" cannot be commanded. If he doesn't "love" them, he doesn't "love" them, and that is the end of it. It cannot be helped.

This new attitude shows itself, although it remains unexpressed, in many ways to those at home. The situation is likely misunderstood, and the boy begins to receive letters of complaint and upbraiding for his neglect of home, for his infrequent and unsatisfactory letters; father writes and says that the boy is making mother very unhappy.

In boisterousness and a bit of rioting, perhaps, the boy covers his feelings, but he is exceedingly unhappy. Books are neglected, for in the solitude of his room

his thoughts gnaw at him. Extravagant diversions give him relief. Is he really a rotter, he wonders. He recalls now with some satisfaction what at the time he refused to admit, that earlier in the year he was a bit homesick. He ought to feel sorry that he has hurt his mother and in a way he does and in a way he doesn't. Is he becoming incapable of affection? He hates silly sentiment, but is he capable of nothing more? At least, he might be loyal to those who have been loyal to him. He might pretend an affection; but that would be grossly dishonest and dishonorable. But is anything more rottenly dishonorable than not to feel a sense of obligation to those to whom one is really obligated? It's all a confused mess. Through misunderstanding and consequent bad handling of the situation at home and through the growing strength of the boy's own biologic urge for independence, the breach grows. Although a fairly satisfactory compromise will likely be found eventually, the boy will gain his first steps in emancipation at a price in unhappiness, loss of time and efficiency that should not have been paid.

From the many emotional problems with which adolescence is faced in any place, but more particularly in college—the losing and finding of one's self in the crowd, the making of friends, the comparisons, physical, intellectual, social, that are forced upon one, the assimilation of new knowledge and points of view, the deciding of courses and principles of actions—I have selected a few. I may not have been happy in my selection, but I have tried to choose the most simple ones, those that are quite upon the surface and in more or less full consciousness, and have been careful to avoid the more complicated problems that lie essentially in the unconscious field, even though these are more significant and more important in their consequences. I have much oversimplified the account, but let us see where even this very simple and obvious account leads us. Have these rather commonplace stresses and strains any significance?

You will probably say not. There is nothing unusual about these experiences. They are more or less the experiences of every student. It is these things that make the man out of the boy; there is probably nothing more valuable in the whole of the boy's college life. We have all been through it. None of us has experienced any particular harm from it, and we can now even look back with considerable amusement at the turbulency of those days.

A boy becomes a man by the mere physical process of living a certain number of years. The quality of his manhood and his effectiveness, however, is quite another thing. If you still believe that all children must have measles and that the sooner they have them the better, then you will see only good in this process. If you believe there may be serious after effects of measles that it is well to avoid, then you may be willing to consider possible after effects in some of these situations. Or, if you are one of those who believe that the best way to teach a boy to swim is to throw him unassisted into water over his head, you will thoroughly approve the present method of letting the boy sink or swim in another situation.

There is not one of us but has his psychic scars of this period. There is probably not one of us but would like to be more efficient, more forceful; would like to see his problems more clearly; to make his work more sharp-cut and direct; to keep to his plan with less distraction; to maintain a better perspective; to gain a closer coöperation with others; to be more successful in presenting his point of view to colleagues; to win greater confidence; to have a larger faith in his own integrity. All sorts of reasons we assign for our failures and mostly they are intellectual. When it comes down to it, we simply haven't the brains. It does not seem to occur to us that we may

not have the full use of the brains we have. I question if it is the quantity or quality of our intellects that hinders us. I am inclined to think it is our emotions we stumble over, our prejudices, our antagonisms, our strong likes and dislikes that pitch us into judgments that we must later find reasons for defending; our habits of thought and stereotyped methods of reacting; our undercurrent of cynicism, perhaps, (in spite of the fact that we thoroughly dislike cynicism), or our too constant and ill-founded optimism, or our false pessimism (false, because we do not intend to be pessimistic, and yet we seem to react pessimistically before we know it); our too great placidity, perhaps, or our touchy irritability; our surprising intolerance, when we pride ourselves on breadth of view; our astonishing lack of generosity, when we wish to be generous; our disconcerting tendency towards disingenuousness, when we wish to be frank; the little intellectual dishonesties we slip into almost unaware, when we believe such things beneath contempt. And yet we are reasonably successful men. No one, and least of all do we ourselves, feel that there is anything mentally wrong with us. The difference, however, between ourselves and our less successful colleagues or between ourselves and those for whose failures we erect hospitals is a difference of degree.

It is not possible here to describe in any completeness the various ways in which the college student may react to his unusually stimulating environment or to trace to their source the various mental habits, helpful and otherwise, he is likely to acquire in his unaided effort to understand both himself and his environment and to find some sort of acceptable compromise between them, but we may select a few for discussion, again the more simple and obvious, and from them judge somewhat of the significance of the whole.

What way he will take depends, of course, upon a good many circumstances —very much upon the mental habits he has formed earlier, somewhat upon his native ability or the congenital quality of his nervous system, to a certain extent upon his physical health and the acuity of his intellect. None of these things, however, even at best, will give more than an added buoyancy to his craft. None is more than an assurance.

He may find his way out quite successfully. He may develop a faculty for analysing situations with an almost uncanny skill. He may learn to meet his problems frankly, and to find a direct way through them. He may be so fortunate as to find some wise person who will help him. But even if this be not so, he may come through even as you and I —sufficiently well to deceive the world most of the time and ourselves at least part of the time and to win a not uncreditable amount of success in productiveness, efficiency, and helpfulness—but with our distinct handicaps.

He may fail entirely. The confident youth of October may by January be a quite disconsolate youth. He is full of worries (a symptom, not a disease); his sleep is bady disturbed; his appetite is gone; he is unable to study, he knows he is going to fail. This adds to the worries, and the vicious circle is confirmed. He has distressing headaches; his eyes bother him; food nauseates him; or he has cramps and diarrhœa or he is constipated; he feels weak all over; it is almost impossible to get up in the morning and, when once up, it takes a mighty effort to get himself about. He likely has his own idea of what is the matter—he has ruined himself with his disgusting habits; the very habits he has been "warned" against. This is not a thing he can see a physician about. He may pack up and go home a self-confessed failure. He may struggle on until the faculty sends him home at the end of the semester. He may consult a physician who, finding nothing wrong with his eyes or his stomach, may dismiss him. If he confides

in the physician his own fears he may find help and assurance if the physician is one who has come to conceive all anatomical parts as equally human; while he may have his worse fears confirmed if the physician is one who is still able to distinguish in man's anatomy both human and animal parts.*

From every university and college there drop out as failures each year a considerable number of young men and young women. The faculty have felt assured that they have not had the intellectual ability to get on and have asked them to go. A sense of failure is thereby added to their already exaggerated feeling of inferiority, and they enter upon their way in the world with a handicap from which they may never succeed in freeing themselves. It is not to be doubted that students do occasionally get into college who are not sufficiently equipped intellectually for college tasks; but a proper investigation will show beyond any question that in a very large ratio of cases the intellectual ability has been quite sufficient, but that enmeshed in a complex trap of emotions, from which in many instances they might quite easily have been extricated, these students have been unable to utilize what intellect they had. The university, with its interest narrowly focused upon the intellect instead of upon the mind as a whole, has seen the failure but has not been interested in carefully investigating the cause or in protecting against it. It would be just as reasonable to neglect a student who had broken his leg and when gangrene had set in, to expell him for not attending his classes. But the boy with a broken leg is not neglected; every possible skilled attention is given him, for the university can see that the broken leg is no reflection upon the boy's intellect,—the intellect will still be worth training after the bones are knit. But the boy who is wrestling with a crisis in his emotions is left to struggle alone, although the consequences may be far more serious, and, when his difficulties have got the best of him, is cast out as unfit. If faculties were composed of those who believe that broken legs and appendicitis are "errors," it would be reasonable of them to demand that the boy with a broken leg correct his "error" and attend his classrooms, or depart. But, although broken legs are tangible, concrete things in the view of faculties and to call them "errors" is ridiculous, these same faculties would seem to see no absurdity in considering emotional difficulties "errors."

A larger number of students than is supposed develop as a result of their experience and its neglect frank mental disease (insanities); others stumble out of the schools only to be picked up and tended a few years later. A very much larger number develop crippling and incapacitating neuroses. Scattered between the two extremes, however, those who successfully find their way through and those who develop frank illness, comes the large body of students, each with his own particular warp. Some are very considerably warped and will recruit the world's supply of college-graduate failures and mediocrities. We may review briefly this group in the making.

In any college group there will be found those who are beginning to edge away from the crowd. This edging away should not be confused with a later adult desire to simplify one's life, to get away from the distractions of manifold duties, the "continuousness of discontinuities," where one can think and plan in peace and quiet. The adolescent group of which I speak withdraws not deliberately in order to think and to solve problems, but instinctively, perhaps, we may say, in order to avoid pain. It is the beginning of a withering-up process as

*I have emphasized here the problem of masturbation, because it is so frequently a source of difficulty; but it is to be remembered that even in those cases where it seems to play the major role, it is not the complete account; although an important element, it is but one of a number of elements in the situation; at best masturbation is but a symptom. Neither is it safe, in cases such as that outlined above, to jump to the conclusion that masturbation is an essential element.

of a plant too long in the direct heat of the sun and leads to various degrees of incapacity, from the *dementia præcox* patient in the hospital, content with his own autistic thinking, to the ineffectual day-dreamer on the outside. Up to now, the student has healthfully been putting out pseudopods, as it were, feeling out and absorbing from his environment; but he begins to find his environment too complex. In whatever direction he pours out a pseudopod, he finds not food but nettles; reality has become too painful; pseudopods become less frequent; he begins to roll up in a ball and to find contentment in a world of his own construction; the less that world is checked with reality, the greater the contentment.

Others, to the same general situation, react a bit differently. Day-dreaming and fantasy-building fill up their lives. Not the day-dreams that are inspirational means to ends more real than reality, the dreams that make the world go round, but dreams that are an end in themselves for they are hitched to no dynamo. These students glow with fine emotions and are frequently the joy of the instructor, because of their quick appreciation of the finer sentiments and ideals he is trying to express. Later he records these students as "disappointments" but with no sense, probably, of personal or university responsibility, or of opportunity neglected, of succor withheld because the need was unrecognized. To him, in all likelihood, the matter is an unfathomable matter of fate, much as he may still consider infant mortality. "The Lord giveth and the Lord taketh away. Blessed be the name of the Lord."

If a keen sense of reality and the habit of constantly correcting one's thinking by reference to reality is necessary in the development of the steadfastness and clearness essential to mental health, so, too, is intelligent honesty; and yet in any college group may be seen the development of contrary habits. An easy expedient in meeting a disagreeable situation, for example, an unattainable desire, is to deny the desire and to minimize the value of the thing wished for. The wish is genuine, nevertheless, and assuming a false attitude merely makes it much harder to meet any later situation in which the wish comes and should be realized.

Emotional difficulties may be met by rationalizing them, a process whereby one succeeds (only partially) in deceiving one's self, although quite frequently others, by assigning for a course of action a reason that is not the real reason, which would be disagreeable and painful, but a reason that is plausible and much more satisfying to one's self-esteem. "I did not apply for a commission in the Medical Corps during the war because I could not be spared from my own community." A true reason in many cases; a rationalization in others. Not meeting the situation does not resolve the mental conflict involved in the situation and this lives to assert itself in many undesirable ways.

There is probably no snare of greater importance to the student than that involved in the development of a feeling of inferiority, for the injuries received here will likely remain with him for the rest of his life. The sources of this feeling are many and cannot be entered into here, but in any adolescent group the infected can be found. There are many types, but probably two of the most common may be discussed. The one is quite obvious; the other more deceptive. The one shows quite clearly by his demeanor that for some reason, quite likely a false one, he has found himself inferior and is accepting his lot. To the puzzlement of his associates he may occasionally burst out in a show of strength, usually at an inopportune time and over unimportant matters, but this only leaves him more defeated and humiliated. Or, he may find relief in coming to consider himself "different," of a finer and more sensitive quality than his fellows, to make capital out of idiosyncrasies, to sentimentalize, to invite moods and to be-

lieve eventually that he is not made of rough world-stuff, but that he is essentially spiritual and poetical.

Quite in contrast is his fellow student who, in his adolescent judgment, thinks he, too, has seen a spectre of inferiority, but who buckles on a thick armor of bravado and defends himself by attacking. The idea that he may be inferior is intolerable, and he endeavors to prove to himself that he is not by developing an enormous self-conceit and by attempting to bowl over opposition. He may not be an unattractive youth and is likely to "get by" for a time but his device is a boomerang.

Equally confusing to the individual and probably even more important in its complicated social effects is the process students find of transferring emotions. Something must be done with a strong emotion. It will not evaporate. It may be partially satisfied by rationalizing a cause for it, or one may rid one's self of it by assigning it to elements in the environment. Borne down by a sense of failure and inadequacy, self-respect may be maintained by finding the cause not within one's self, but in the unfairnesses and the unjustness and the misunderstanding of others. They and not we are to blame; self-respect is in part maintained, but at the cost of a habit that is insidious and capable of much elaboration and development. Emotions may be transferred bodily, so that what is in reality a dissatisfaction and disgust with one's self becomes an intense dislike and antagonism towards another individual against whom we have no cause for complaint, except—and this we may realize but vaguely—that he somehow keeps us aware of the deficiencies and inadequacies we are trying to ignore.

These and similar reactions, simple and harmless as they may seem, lead, as those who have cultivated them move in life to more critical and complicated relationships, to many perplexing personal and social difficulties.

During the social confusion of the last few years there have been those who have been puzzled, or alarmed, or angered by the apparent radical tendencies of college groups. On the whole these "radicals" have been among the more intellectual of the students, in spite of the fact that some have found reason to question their intellectual capacity and others have considered them "cracked" or not just right in the head. Few, I think, except in psychiatric circles, have considered them university casualties and yet, clearly, that is what many of them are. The intellectual integrity of many cannot be questioned whether we approve of their views or whether we do not, but the mental integrity of others is quite open to question. Two men may hold identically the same opinion on any given subject and one may be mentally sound and the other mentally sick. The sanity or lack of it is not to be determined by the opinion but by the source of the opinion. Very many of these young radicals, and, just as truly, very many of their most zealous opponents, both old and young, are of, or derived from, the group of students we have been discussing — students whose intellects and whose physical condition have been carefully attended to, but whose emotional lives and habits have been permitted to take their own course. Finding no other suitable outlet, emotional energies generated at sources quite apart from and bearing but slight if any relationship to the situation at hand (usually quite ascertainable sources) have flown into these social situations. At first the student may be quite surprised at the intensity of his reaction to a situation about which he thought he had some doubt. He is somewhat taken aback by the strength and sharpness of his ability to "hate" and to "admire" in spite of a faint intellectual questioning. But whatever of intellectual doubt there may have been in the beginning is soon swallowed up in the intensity of his emotions, and

his personal reaction (emotional) to a situation is taken as a personal understanding (intellectual) of the situation. In such a position he is impregnable, for direct assault is not possible. We blame him for the harm he may do. In time of war we throw him into prison and in time of peace we hurl epithets; if we have any feeling of responsibility for him, it is probably no more than a weakly eugenical one of blaming ourselves for ever having permitted him to be born.

In no case is the process quite as simple as I have described it. These few types of reactions that I have discussed do not occur singly, but in various combinations one with the other and with many deeper lying and more complicated reactions that I have not discussed until the result becomes the seemingly inexplicable thing we know as temperament or personality or idiosyncrasy, or queerness, or disease, depending upon the qualitative or quantitative variant of its elements, but, in any case, all off the same piece of cloth. Thus the fount from which pours out our emotional life may be poisoned at its source. Our personalities cannot endure naked before the forces that assail them any more than can our bodies. Protection of some kind becomes necessary, but in building our protection we build clumsily, for we burden ourselves by seeking to protect ourselves, not alone from the forces, but from the fears that for us still reside in the forces. In the physical field knowledge has made us more skillful. We erect roofs over our heads to protect ourselves from the elements; but we are helped by knowing that those roofs are to protect us from the rain, the wind, and the cold, and not handicapped by believing we must build against demons and angry gods that reside in these elements.

In spite of increased skill in training intellects and in spite of increased facilities for the protection of the physical health of students, and more power to both of them, the goal, if that goal be the increase of human happiness and efficiency, will not be reached by these alone, for neither happiness nor efficiency is fundamentally dependent upon them. Emotions as well as intellect and mental health as well as physical health must be made a part of the program. In thus widening our program we will have immediately in mind:

1. The conservation of the student body; that intellectually capable students may not be forced unnecessarily to withdraw but may be retained;

2. The forestalling of failure in the form of nervous and mental disease—immediate or remote;

3. The minimizing of partial failure in later mediocrity, inadequacy, inefficiency, and unhappiness;

4. The making possible of a larger individual usefulness by giving to each a fuller use of the intellectual capacity he possesses, through widening the sphere of conscious control and thereby widening the sphere of social control.

□

Not too early to be thinking about the Fifteenth Annual Meeting of the A. P. H. A. in New York City, November 14-18, 1921.

STANDARDIZATION OF BOTULISM ANTITOXINS

IDA A. BENGTSON,
Bacteriologist, Hygienic Laboratory,
U. S. Public Health Service,
Washington, D. C.

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THE value of standard methods for testing and for stating the potency of diphtheria and tetanus antitoxins is universally acknowledged. Before the work at the Hygienic Laboratory was done,* establishing United States standards for these products, nothing definite was known as to the comparative strength of different lots of antitoxin in this country. Firms manufacturing these serums used different units in expressing the potency of their respective products and different methods of testing so that it was difficult or impossible to compare the strength of one antitoxin with another.

Official standards have been promulgated by the United States Public Health Service and a unit established for measuring the potency of tetanus and diphtheria antitoxin, and the testing of these products has been placed on a very satisfactory basis. A uniform method of stating the potency or the number of units contained in a serum per cc. has been adopted. Serums are required to contain a certain number of units and immunizing and therapeutic doses are prescribed in terms of U. S. units instead of volume. The advantages are so obvious as not to require elaboration.

While the value of treatment of botulism with the antitoxin of *Bacillus botulinus* is uncertain in cases where severe symptoms have developed, it is possible that it may be of some value in cases showing mild symptoms and of definite value when it is possible to use it prophylactically, such as might be the case when one or more members of a group who have partaken of food contaminated with *B. botulinus* fail to develop symptoms as early as others. Since the serum is the only specific treatment known for the disease, it is probable that recourse will be had to the use of antitoxin whenever it is available. Such being the case, it is necessary that the serums be potent and that we have a standard method whereby we may measure their potency. The purpose of this work has been to establish such standards.

The method used by the Hygienic Laboratory for the testing of botulism antitoxins types A and B, does not differ in principle from that used for measuring the potency of diphtheria and tetanus antitoxins. An arbitrary amount of standard antitoxic serum for each type is used as the unit of measurement for determining the potency of antitoxins of unknown potency. Both the standard antitoxin of known value of which a definite amount is used and the antitoxin under test of unknown value of which varying amounts are used, are tested against the same dose of toxin, and by a comparison of the results obtained the potency of the unknown antitoxin may be determined in terms of the standard antitoxin.

Toxin.—Cultures of *B. botulinus* of both types A and B yield strong toxins when grown in dextrose beef infusion broth containing a small amount of veal incubated at 37° C. for a period of 10 to 14 days. An initial reaction of pH 9.0 has been found favorable for production of strong toxin. Toxins varying in strength from 0.000,01 to 0.000,1 cc. of filtrate as a minimal lethal dose for 250-gram guinea pigs were obtained by the use of this medium. The filtrate was found to be fairly stable and the toxin

*Hygienic Laboratory Bulletin No. 21, and Miscellaneous Publication No. 10, U. S. Public Health Service, Washington, D. C.

may be used in this form for testing the potency of unknown antitoxins. It seems probable that there is a certain amount of slow deterioration and that the filtrate may reach a stage of equilibrium after a process of "ripening" as in the case of diphtheria toxin. Until further experiments have been carried out to determine whether this is true, it will be necessary to test any particular filtrate each time it is used against the standard antitoxin unit to determine the "test dose."

In our work of standardization dried toxins were used. Tetanus toxin, though exceedingly unstable and unreliable in the form of filtrate, has been found to be very stable in the dried state continuing at the same point of toxicity over a period of many years when preserved under proper conditions of cold and protected from light and air. It was apparent that a considerable period of time would be necessary to accomplish the work of standardization and it was desirable that the toxin be stable over at least this period. Therefore, it seemed advantageous to use dried toxins which might be expected to be as stable as dried tetanus toxin has been shown to be. This has been found to be the case and exposure of the dried toxin to adverse conditions of temperature, light, etc., has shown it to be at least as stable as the tetanus toxin and probably more so.

Precipitation of the toxin was effected by the same methods as those used for the precipitation of tetanus toxin. By saturating with ammonium sulphate the toxin was salted out and could be skimmed from the surface. After drying over sulphuric acid it was ground to a fine powder and stored *in vacuo* in the cold and dark. The most potent toxin obtained by this method was fatal to a 250-gram guinea pig in amounts of 0.000,000,1 g.

Antitoxin. — For the standard antitoxins, the most potent serums of each of the types which were available at the time were mixed with glycerin in the proportion of one part of serum to two parts of glycerin. This was distributed in small glass-stoppered bottles of 7-8 cc. capacity. Whether antitoxin preserved in this way is as stable as a dried serum is not certain, but a number of tests which have been carried out at stated intervals against dried toxins indicate that the preparation is very stable.

Standardization.—A dried toxin of each of the types A and B was used as the basis for determining the standard unit. The approximate minimal lethal dose for a 250-gram guinea pig was determined for each toxin and an arbitrary amount of toxin containing about 100 minimal lethal doses was used as a test dose preliminary to establishing the unit. The smallest amount of glycerinated serum of each type, which when mixed with this test dose of its corresponding toxin and injected into a 250-gram guinea pig, caused the death of the guinea pig within 96 hours, was considered to contain 1/10 of a unit; a unit of the standard antitoxin, therefore, just fails to neutralize approximately 1,000 minimal lethal doses of the original dried toxin. In all tests if guinea pigs weighing more than 250 grams are used, the doses of toxin and antitoxin are increased in proportion to the weight.

Testing.—In carrying out a test to determine the potency of an antitoxin of unknown value the standard antitoxin is used as the basis of measurement. The test dose of toxin used in establishing the standard in the hygienic laboratory as stated above, was approximately 100 minimal lethal doses of the dried toxins originally used, but in carrying out tests in which other toxins are used it will be necessary to determine the test dose by titrating the particular toxin against 1/10 the standard unit of antitoxin. The dose will probably vary from 50 to 200 minimal lethal doses, since the combining power of different toxins is variable. The test dose of toxin will be that amount which when mixed with 1/10 the standard antitoxin unit and injected into a 250-gram guinea pig just fails to

TABLE 1

POLYVALENT ANTITOXIN X

	Guinea pig No.	Weight	Toxin: Type	Toxin: Dose per 250 g.	Toxin: Actual dose	Toxin: Dilution	Toxin: Amount of dilution injected	Antitoxin: Type	Antitoxin: Dose per 250 g.	Antitoxin: Actual dose	Antitoxin: Dilution	Antitoxin: Amount of dilution injected	Salt solution to make a total of 4.0 cc.	Time of death
Standard Antitoxins	790	250 g.	Type A	0.00034 g.	0.00034	1/5000	1.7 cc.	Standard Antitoxin A	0.04 cc.	0.04 cc.	1/25	1.0 cc.	1.3 cc.	60 hrs.
	791	280	Type A	0.00034	0.00038	1/5000	1.9	Standard Antitoxin A	0.04 cc.	0.0448	1/25	1.12	1.0	99 hrs.
	792	250	Type B	0.0018	0.0018	1/1000	1.8	Standard Antitoxin B	0.0008cc.	0.0008	1/1250	1.0	1.2	76 hrs.
	793	280	Type B	0.0018	0.00202	1/1000	2.02	Standard Antitoxin B	0.0008cc.	0.000895	1/1250	1.12	0.9	92 hrs.
Antitoxin under test	799	250	Type A	0.00034	0.00034	1/5000	1.7	Antitoxin X	0.1 cc.	0.1 cc.	1/10	1.0	1.3	Survived
	800	250	Type A	0.00034	0.00034	1/5000	1.7	Antitoxin X	0.01	0.01	1/100	1.0	1.3	Survived
	801	260	Type A	0.00034	0.000354	1/5000	1.77	Antitoxin X	0.005	0.0052	1/100	0.52	1.7	Survived
	802	270	Type A	0.00034	0.000367	1/5000	1.84	Antitoxin X	0.002	0.00216	1/500	1.08	1.1	57 hrs.
	803	280	Type A	0.00034	0.00038	1/5000	1.9	Antitoxin X	0.001	0.00112	1/1000	1.12	1.0	47 hrs.
	804	300	Type A	0.00034	0.000408	1/5000	2.04	Antitoxin X	0.0005	0.0006	1/1000	0.6	1.4	26 hrs.
	805	250	Type B	0.0018	0.0018	1/1000	1.8	Antitoxin X	0.1	0.1	1/10	1.0	1.2	Survived
	806	250	Type B	0.0018	0.0018	1/1000	1.8	Antitoxin X	0.01	0.01	1/100	1.0	1.2	47 hrs.
	807	260	Type B	0.0018	0.00187	1/1000	1.87	Antitoxin X	0.005	0.0052	1/100	0.52	1.6	27 hrs.
	808	270	Type B	0.0018	0.00194	1/1000	1.94	Antitoxin X	0.002	0.00216	1/500	1.08	1.0	24 hrs.
	809	280	Type B	0.0018	0.00202	1/1000	2.02	Antitoxin X	0.001	0.00112	1/1000	1.12	0.9	17 hrs.
	810	300	Type B	0.0018	0.00216	1/1000	2.16	Antitoxin X	0.0005	0.0006	1/1000	0.6	1.2	17 hrs.

The results of this test show that the amount of antitoxin just sufficient to neutralize a test dose (approximately 100 minimal lethal doses) of toxin A lies between 0.005 and 0.002 cc. and for type B between 0.1 and 0.01 cc. Another test was, therefore, put on with decreasing amounts of antitoxin at intervals of a percentage difference of about 50 between these limits (Table 2).

TABLE 2

POLYVALENT ANTITOXIN X

	Guinea pig No.	Weight	Toxin: Type	Toxin: Dose per 250 g.	Toxin: Actual dose	Toxin: Dilution	Toxin: Amount of dilution injected	Antitoxin: Type	Antitoxin: Dose per 250 g.	Antitoxin: Actual dose	Antitoxin: Dilution	Antitoxin: Amount of dilution injected	Salt solution to make a total of 4.0 cc.	Time of death
Standard Antitoxins	846	250	Type A	0.00034 g.	0.00034 g.	1/5000	1.7	Standard Antitoxin A	0.04 cc.	0.04 cc..	1/25	1.0 cc.	1.3 cc.	96 hrs.
	847	270	Type A	0.00034	0.000368	1/5000	1.84	Standard Antitoxin A	0.04	0.0432	1/25	1.08	1.1	122 hrs.
	848	250	Type B	0.0018	0.0018	1/1000	1.8	Standard Antitoxin B	0.0008	0.0008	1/1250	1.0	1.2	113 hrs.
	849	270	Type B	0.0018	0.00194	1/1000	1.94	Standard Antitoxin B	0.0008	0.000865	1/1250	1.08	1.1	94 hrs.
Antitoxin under test	835	250	Type A	0.00034	0.00034	1/5000	1.7	Antitoxin X	0.0068	0.0068	1/100	0.68	1.6	Survived
	836	260	Type A	0.00034	0.000354	1/5000	1.77	Antitoxin X	0.0045	0.00467	1/100	0.467	1.8	Survived
	837	260	Type A	0.00034	0.000354	1/5000	1.77	Antitoxin X	0.003	0.00312	1/500	1.56	0.7	Survived
	838	290	Type A	0.00034	0.000394	1/5000	1.97	Antitoxin X	0.002	0.00232	1/500	1.16	0.9	113 hrs.
	839	250	Type B	0.0018	0.0018	1/1000	1.8	Antotixin X	0.12	0.12	1/10	1.2	1.0	Survived
	840	260	Type B	0.0018	0.00187	1/1000	1.87	Antitoxin X	0.08	0.083	1/10	0.83	1.3	Survived
	841	260	Type B	0.0018	0.00187	1/1000	1.87	Antitoxin X	0.053	0.055	1/10	0.55	1.6	Survived
	842	270	Type B	0.0018	0.00194	1/1000	1.94	Antitoxin X	0.035	0.0378	1/50	1.89	0.2	Survived
	843	280	Type B	0.0018	0.00202	1/1000	2.02	Antitoxin X	0.023	0.0258	1/50	1.29	0.7	113 hrs.
	844	290	Type B	0.0018	0.00208	1/1000	2.08	Antitoxin X	0.015	0.0174	1/100	1.74	0.2	89 hrs.
	845	300	Type B	0.0018	0.00216	1/1000	2.16	Antitoxin X	0.01	0.012	1/100	1.2	0.6	65 hrs.

The antitoxin contains at least 33 units of type A antitoxin, since 0.003 cc. of the antitoxin protected against the test dose of toxin A and about 3 units of type B antitoxin since 0.035 cc. protected against the test dose of toxin B.

be neutralized by this amount of antitoxin, as shown by death within 96 hours. The test dose of toxin having been established, the number of units in the antitoxin of unknown value is determined by testing varying amounts of antitoxin against the "test dose" of toxin. The smallest amount of antitoxin for human use which when mixed with the test dose of toxin is sufficient to *save* the life of a 250-gram guinea pig is considered to contain 1/10 of a unit. From this the number of units per cc. may be calculated. Control animals are inoculated at the same time with the same dose of toxin mixed with 1/10 of the standard unit and this amount of the standard should just fail to neutralize the dose of toxin.

Since the two types of *Bacillus botulinus* produce toxins which appear to be entirely specific, it is necessary to test a serum of one of the types against the homologous type only. A "polyvalent" antitoxin is tested for its neutralizing power against the toxin of both types A and B.

Several antitoxins from different sources have been tested at the Hygienic Laboratory and have been found to have unitages ranging from 2 to about 450 per cc. Judging from the rather limited number of serums tested, it appears that antitoxins against type A toxin, the type which would have been applicable in most of the recent cases of food poisoning due to *B. botulinus,* have been low in potency, some of the earlier ones containing only two units per cc. Some later polyvalent antitoxins have contained up to about 40 units of type A antitoxin. Very much stronger antitoxins of type B have been received. It also appears from a limited number of observations on the serums received for test that it is difficult to produce "polyvalent" sera, and that in such sera antitoxins of one or the other type are predominant, though the horses have received the same amounts of the two different toxins.

The following is an example of a test on a polyvalent antitoxin of unknown potency. (Tables 1 and 2):

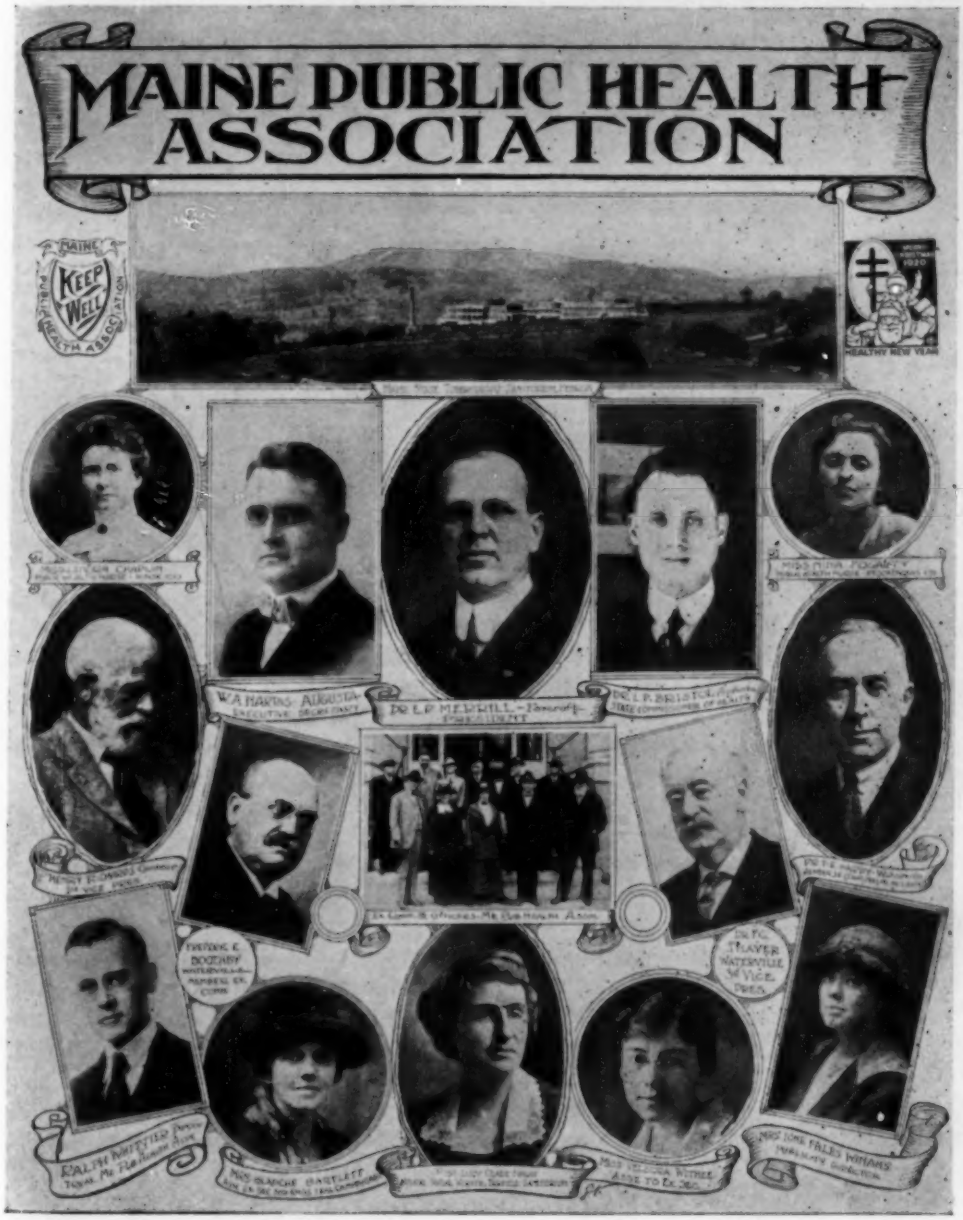
A statement of the definition of the unit and method of testing is appended:

The unit of botulism antitoxin (type A) is a definite amount of the standard antitoxin; for the standard antitoxin in the concentration used at present, and to be sent out to serum establishments which may be licensed for the production of botulism antitoxin, the unit is 0.4 cc. of the glycerinated solution. The antitoxin to be tested is compared with the standard unit by means of a test dose of toxin; any toxin which is several weeks old may be used for this purpose; this test dose of toxin is chosen so that when mixed with 1/10 of a unit of the standard antitoxin and injected subcutaneously into a 250-gram guinea pig, the guinea pig will die in about 96 hours. That amount of the unknown antitoxin which when similarly mixed with the test dose of toxin and injected will protect the 250-gram guinea pig for about 96 hours, therefore contains 1/10 of a unit. The test dose of toxin will usually be found to contain from 50 to 200 minimal lethal doses. Before injection the doses of toxin and antitoxin are to be thoroughly mixed, and then kept at room temperature for one hour to allow combination to take place. The guinea pigs should be between 250 grams and 300 grams in weight and the doses of toxin and antitoxin are to be increased proportionately to the weight for guinea pigs weighing over 250 grams. With every test of an unknown antitoxin, two control guinea pigs should receive the test dose of toxin mixed with the test dose (1/10 unit) of standard antitoxin, so that the two antitoxins may be accurately compared and the test dose of toxin increased if necessary in subsequent tests; liquid toxins have been found to decrease gradually in toxicity. In diluting the standard antitoxins, the method indicated on the label should be followed.

The first dilution should be made with a capacity pipette, to be washed out in the diluting fluid, on account of the viscosity of the glycerinated serum.

The unit of botulism antitoxin (type B) is similarly a definite amount of the standard type B antitoxin; for the standard antitoxin in the concentration used at present, and to be sent out to serum establishments which may be licensed for the production of this antitoxin, the unit is 0.008 cc. of the glycerinated solution. The antitoxin to be tested is compared with the standard unit by means of a test dose of type B toxin using the same method as above described for type A.

PUTTING THE M.P.H.A. IN THE SUNDAY NEWS—A Full Page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THE HEALTH OF THE COLLEGE

In appraising the health of the college and university, allowance must be made for the salient advantage which they enjoy in comparison with ordinary communities—a homogeneous population falling within one of the most disease-resistant age groups.

Considering this advantage and the unequaled opportunity which the college has for carrying out a high-grade health program, the question is not "Is the health of the students good?" The answer to that question goes without saying, with no accruance of credit to the college. Youth will survive in an apparently highly viable state under almost any circumstances. The question is, rather, "Is there a comprehensive, actively executed plan to eliminate what serious defects exist among the college population; to correct the minor (so-called) interlocking handicaps, such as unnecessary fatigue, constipation, eye-strain, poor posture, etc., so often unappreciated as drags on academic accomplishment and as the beginnings of the ailments of middle life; to protect the college population from epidemic disease; to demonstrate results, and to make the college pre-eminent in sanitary organization?"

With its homogenous population, and its compact, long-tenure organization, the college is in a uniquely favorable position to carry to their conclusions all the lines of public health work—educative, protective and corrective. It can control living conditions and furnish a scientifically adjusted diet for a large part if not all of its students. It can encourage habits of outdoor exercise that will form a lasting foundation of vitality. It can make complete and frequent physical examination for the students' immediate benefit and for scientific study. It can keep complete morbidity statistics of the student body, and vital statistics of the alumni. There should be frequent, regular publication of the college bill of health, with no omission and no concealments. (The days of secrecy as a public

health measure to forestall hysteria have passed.) Such data should be used as part of the material for a powerful system of instruction and propaganda for better college health. Health instruction should be under constant supervision not only to answer the question of whether or not the students enjoy it, but to ensure its scientific soundness and to demonstrate that it plays more than a negligible part in the prevention of disease.

The college infirmary, where the institution is located in towns of any size, can, in conjunction with local hospitals, make full use of the principle of group and consultative diagnosis, on its medical side. The infirmary should, however, function primarily as a prophylactic clinic, with an unfailing system of receiving and acting on reports of communicable disease. The college should control, according to the most approved standards, the general sanitation of the plant.

All of these phases of health work should be tied together by an interdepartmental health board including every department that has a contribution to make—bacteriology, chemistry, medicine, publicity, hygiene, physical education—and excluding professional precedence *per se*. These and other things, which the ordinary community can never hope to accomplish with any degree of completeness, the college can, if it will, put into effect with whatever balance between paternalism and individual freedom of choice it sees fit to establish. Not by its fruits, but by its accomplishment in relation to its opportunities, shall we know it, the college board of health. Certainly the obligation of the college is plain, both toward its students and toward the community in which it is situated.

Fortunately there are institutions which have progressed far in the direction of a strong health organization. Furthermore, the recently established Students' Health Association (which, let us hope, will in the near future increase the value of its work by issuing a publication) may perform an important service in making comparative studies whereby college faculties and governing bodies may be quickly educated to a knowledge of the importance of a high standard of public health and of what can be and is being done to attain it.

E. C. HOWE.

THE TOLL OF WHOOPING COUGH AND MEASLES

If we exclude the pneumonias, our most common acute infectious diseases are diphtheria, whooping cough, measles and scarlet fever.

Diphtheria and scarlet fever are regarded very seriously and are much feared by the public. This is as it should be, for certainly these diseases have taken their deadly toll each year. But whooping cough and measles are considered trivial diseases by many parents and even a few health officials. There is, in fact, a current belief that, since children will probably have these diseases at some time, the sooner they are "had" and "over with" the better.

Yet 5% of all deaths under five years in Massachusetts for the five-year period 1915-19 were from whooping cough and measles as against 3½% from diphtheria and scarlet fever. In the second year of life the figures were 11.2% for the former two diseases and 5.6% for the latter. In the first year the figures were 2.2% and .5% respectively. Both whooping cough and measles are among the first ten causes of death for children under five. Either one causes more deaths in this age group than combined deaths from typhoid fever, smallpox, syphilis, infantile paralysis and cerebrospinal meningitis. In the second year of life measles has killed more children under five than any other acute infectious

disease except pneumonia (many pneumonia deaths being in fact complicated by measles).

Education is the chief remedy. Such measures as prompt reporting of cases, their isolation, daily school inspection and the follow-up of school absentees must, of course, be strictly carried out. But education is, in the long run, surer and of more permanent value. It is based on reason and is not arbitrary. Without it necessary coöperation cannot be obtained. With it the need of the restrictions imposed will be appreciated by the public with the result that their help is obtained.

In our teaching we must emphasize the fact that the greatest danger from these diseases is in the early years of life—before the end of the fifth year and especially before the end of the third. If parents could defer them until the end of the third year most of the 79% of our measles deaths and of the 85% of our whooping cough deaths that occur before then would disappear. If the evil day could be deferred until the end of the fifth year the figures would be 90% and 95% respectively. When we consider the small remaining mortality from these diseases after five years of age, for instance, the wisdom of trying to defer them that long at least is apparent.

Another point on which we must educate the public is that many of these deaths are from complications with pneumonia and other diseases and that with proper medical, nursing and hygienic care these complications are largely preventable. Complications are frequent and not trivial and every case should be under a doctor's supervision and instruction.

EUGENE R. KELLEY, M.D.

CORRECTIONS.

In the January JOURNAL, page 71, Dr. Henry Hanson, author of an article on "Sanitary Conditions in Peru," page 13 et seq of the same issue, is referred to as "a Boston man." The impression came to the editor through association with Mr. Philip Ainsworth Means, who is a Boston man, that he also belonged in that city. From Dr. Victor H. Bassett of Savannah, Ga., the JOURNAL has received the following note concerning Dr. Hanson, which sets forth the story which correspondence with the gentleman himself failed to develop.

"Dr. Hanson was born in South Dakota and is a graduate of the University of South Dakota and of Johns Hopkins Hospital Medical School. Dr. Hanson received his experience, prior to his work in Panama, in the West and South, having served on the staff of the Milwaukee County Hospital as Pathologist and Assistant Superintendent, and having had charge of the laboratory work of the Florida State Board of Health in Jacksonville and in the branch state laboratories in Pensacola, Tampa and Miami."

J. R.

The February issue of the JOURNAL contained the following statement on page 106 in the article of Dr. George Hoyt Whipple on "The Value of Animal Experimentation by Mankind":

"An accurate and conclusive diagnosis [of rabies] can only be made by means of inoculating material from the suspected animal into a normal animal."

A communication from the author is received to the effect that the intent was to emphasize the value of animal inoculation as a confirmatory test. The importance of the microscopic test for negri bodies is freely granted by the author.

A. W. H.

In Memoriam

THE PUBLIC HEALTH WORK OF PROFESSOR SEDGWICK

WILLIAM THOMPSON SEDGWICK, son of William and Anne Thompson Sedgwick, was born at West Hartford, Connecticut, Dec. 29, 1855. His colonial ancestor was Robert Sedgwick who settled in Boston in 1636. He studied at the Sheffield Scientific School, the Yale Medical School, and Johns Hopkins University. On his 26th birthday he married Mary Katrine Rice at New Haven, Connecticut. In 1883 he came to Boston and the Massachusetts Institute of Technology, where for thirty-eight years he was Professor of Biology and Public Health. He died at Boston, January 25, 1921, at the age of sixty-five.

These simple facts tell who Professor Sedgwick was. But what he was and what his life meant to the people of Boston, to hundreds of young students, to the science of public health, and to the Commonwealth of Massachusetts cannot yet be told or even estimated. His death is too recent and our thoughts are still so touched with sadness that one cannot adequately picture his manifold activities or form a just appreciation of his life or his place in history. But in the various notices already written a few words stand out prominently and must be regarded as characteristic of the man. The words are service, public service, kindliness, serenity, inspiration, buoyant optimism, love of young men. Let these suffice. They are eulogy enough for any man.

I have been asked to tell you something about Professor Sedgwick's work in public health. I cannot do so without saying more about my own relations to it than might be becoming, but it is characteristic of his work that it was not done in the seclusion of his study and laboratory, but involved all those with whom he came in contact.

I first knew Professor Sedgwick when I was a student of engineering and he Professor of Biology at the Institute. He was thirty-three and I was twenty-two. For the first time (1888-9) he was giving a course of lectures in bacteriology to civil engineers. It was an innovation. Until then sanitary engineering had leaned for support on chemistry, and here was a new science coming to its aid. I have in my study the notes which I took of Professor Sedgwick's weekly lectures. They began as follows: "The sanitarian needs a proper working theory." Then he proceeded to develop the germ theory of disease as he had learned it from Pasteur and the European scientists who were laying the foundations of that science which has done so much for the health of the world. He showed how physicians and engineers had been wrong, how they had groped in the dark, and how, by applying the recently discovered principles of biology, it was possible to give to sanitary engineering new life. Of course, Sedgwick was not the only American to take up with the new ideas. There was Dr. Welch at Johns Hopkins, Dr. Biggs in New York, and others who were doing the same thing. But these other men were in medical schools; Sedgwick was at the Institute of Technology where the engineering sciences predominated and therefore his influence on sanitary engineering was the greatest. Nor would it be right to ignore the work of his colleagues in chemistry, such as Professor William Ripley Nichols and Dr. Thomas M. Drown. It was the combination of chemistry and biology with engineering which made the profession of sanitary engineering what it is—a profession which we are proud to think has become more highly developed in America than in any other country.

It is important to keep in mind certain dates in connection with the work of these Massachusetts scientists. Louis Pasteur's pioneer work in bacteriology was done in the seventies. In 1876 Robert Koch discovered the germ of anthrax. In 1882 he suggested the use of solid culture media and thus made it possible to consider bacteria in a quantitative way. In 1880, Eberth found the bacillus of typhoid fever. In the same year Laveran had discovered the parasite of malaria. In 1883-4 Klebs and Löffler found the germ of diphtheria, and in 1883 Koch the cholera spirillum. Then remember, it was in 1883 that Sedgwick undertook his work in Boston. No wonder that he saw a great future for his beloved science of biology; no wonder that he gave up his intention of being a physician.

Sedgwick did not study bacteriology in Europe, but I remember hearing him tell how he received what was perhaps the first batch of Dr. Koch's sterilized nutrient gelatine sent to this country. Professor Nichols brought it over and probably had not realized its physical properties, for it had melted, had saturated the cotton plug of the flask, had oozed out, had become infected and nauseating and was about as far from having the required bacterial purity as one could imagine. It was an inauspicious beginning for bacteriology at the Institute. Professor Nichols must have chuckled over it, for at that time he did not share Sedgwick's optimism in regard to the future of this science.

I remember those first lectures of Sedgwick's. He would hold up a glass of water and talk for an hour about what it contained. He would excite us by saying that it contained enough germs of typhoid fever to give the disease to a thousand people, and then go on to show how sanitary engineers could make the water safe to drink.

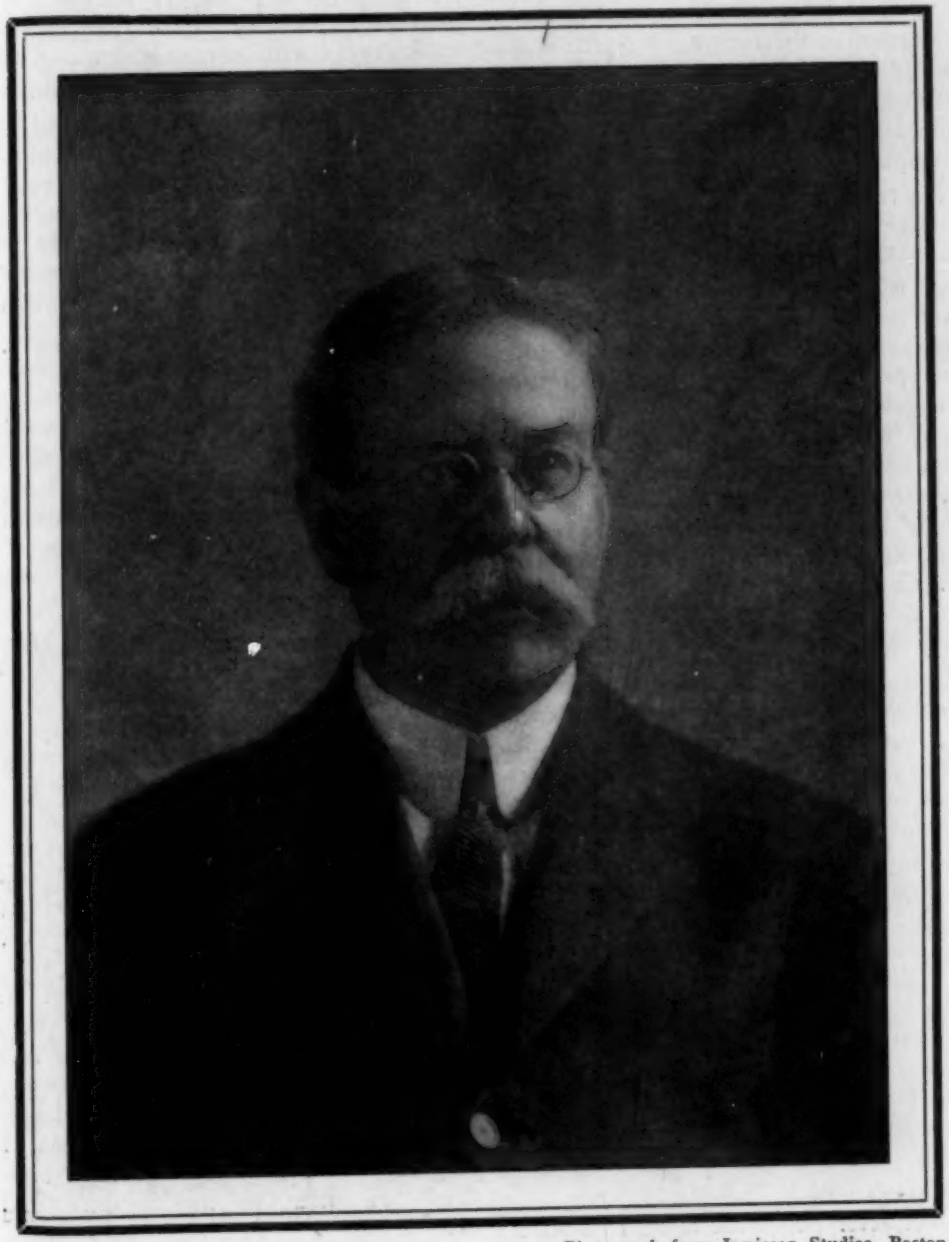
He started his students off on a hunt for bacteria. One of them studied the bacteria found in air, especially the air of hospitals, for he was hunting for big game. Together they devised a method for straining the bacteria from the air—an aërobioscope—a method still used. Another student helped him to study water, not only its bacteria, but its other microscopic organisms. Another new method of study was devised, the Sedgwick-Rafter method, still used today.

One of his students took up the study of milk; another that of food; and today the Institute has an important department of industrial biology. Several studied sewage and its methods of treatment, and for years this continued to be a fruitful field of research. Another studied the bacteriology of ice; and still another the bacteriology of soil. Then there were studies of particular species of bacteria, the longevity of the typhoid bacillus, and so on. The reason for mentioning these things is to illustrate the breadth of the investigations and the fact that Sedgwick always worked with and through his students. He did very little scientific work alone and he generally gave to his students more than a fair share of the credit for the work done.

When, after a long experience as a practicing engineer, I came to Harvard to teach, I had many talks with Sedgwick about methods of teaching. He was no longer thirty-three years old, but fifty-five. He had been teaching for twenty-five years, and he gave from his experience. He said: "I keep three things in mind,—the past, the present, and the future. First, I teach by the historical method. That has two advantages: my students learn what has been done, and my lectures don't have to be written over every year. Second, I teach of what is going on now." His present-day students knew well his habit of rushing into the lecture-room with a clipping from the morning paper or a copy of a medical journal and talking about something which someone had discovered in Chicago or the Fiji Islands, or about some

WILLIAM THOMPSON SEDGWICK

1855-1921



Photograph from Jamieson Studios, Boston

new engineering project. All kinds of fish were caught in his net, and he believed that the students should study these fish while they were alive. Thirdly, he said, "I try to teach of what is likely to happen in the future. I try to make the students see the problems they will be up against." History, present problems, and research,—these were his three principles.

His teaching was far from being exact. Sedgwick did not have a mathematical mind. His lectures were never formally prepared and as he grew older they became less methodical. He cared for general principles more than for details. The opening sentence of his first lecture to engineers which I have already quoted shows what he wanted most to impress upon his students. "The sanitarian needs a proper working theory." But it was chiefly his personal magnetism and his inspiration which told on his students, and this never failed him. His optimism was as strong at sixty-five as it was at thirty-five.

Sedgwick will be remembered first and foremost as a great teacher,—yes, even as a teacher of teachers,—because his enthusiasm was contagious and others followed in his steps. One has only to mention Dr. Calkins of Columbia, Dr. Jordan of Chicago, Dr. Winslow of Yale, Professor Gunn, and others, now well-known, to realize the extent of Sedgwick's influence as a teacher upon teachers. But among his pupils are sanitary engineers, bacteriologists, health officers, laboratory workers in many fields, Red Cross officials, physicians, nurses, manufacturers, teachers of domestic science, housewives,—men and women, a great company of enthusiastic followers, who recognized him as "Chief."

Soon after Sedgwick came to Boston the Massachusetts State Board of Health began to apply the new ideas in biology and chemistry to the purification of water and sewage under the leadership of Dr. Henry P. Walcott, who for a quarter of a century was Chairman of the Board, and Mr. Hiram F. Mills, a hydraulic engineer, who for an equally long time gave most valuable service to the Commonwealth. A small station for making experiments with sewage and water was built at Lawrence, Mass. Professor Sedgwick was consulting biologist of the Board and Dr. Drown was consulting chemist. For many years, even up to this day, the Lawrence Experiment Station has been a center of scientific activity. Some of the leading sanitary engineers of the country began their work there.

While this scientific study of the chemistry and biology of water and sewage was in full activity (1890), a notable epidemic of typhoid fever swept down the Merrimac valley. Professor Sedgwick made a thorough study of this catastrophe and developed methods of investigation which have been followed by American epidemiologists ever since. Although not a mathematician, he marshalled statistics and used them with telling force and drew from them logical conclusions which could not be upset. As a result of the epidemic and the research at the experiment station, the first scientifically designed municipal water filter in America was built at Lawrence. In this matter one cannot give the credit to Sedgwick alone, for it was the entire group of scientists who deserve the credit, Mills, Stearns, Drown, Sedgwick, Hazen, Fuller, and others, most of all perhaps to Mr. Mills. Through them America gave to the world scientific ideas in regard to the disposal of sewage which revolutionized methods of treatment and stimulated the construction of disposal works in scores, perhaps hundreds of cities, in this country and abroad.

Sedgwick became a great interpreter of this scientific work. He joined the New England Water Works Association in 1890, but as early as 1888 he had contributed a paper on the "Biological Ex-

amination of Water." He was chosen President of the Association in 1905, having already, in 1904, been made an Honorary Member. His last address before the Association was delivered on September 11, 1918, on a subject appropriate to the times, "From Peace to War, from War to Victory, from Victory to Just Judgment." Those who heard it will never forget the stirring words in which he called for stern justice for Germany and appealed to a higher ideal of God than that held by the Kaiser, —the ideal of Christianity, the ideal of civilization. Sedgwick never separated his science from his patriotism or his religion. He could make science popular and he could take subjects of popular interest and clothe them in the language of science.

The American Public Health Association also claimed Sedgwick's attention. He became a member in 1902 and its President in 1915. He was a member of many committees, was a frequent speaker, most of his addresses having relation to the broader aspects of public health work. It is hardly worth while at this time to recite the long list of scientific societies to which he belonged, but mention should be made of the Society of American Bacteriologists, which he helped to found and of which he was President in 1900, of the American Society of Naturalists, over which he presided in 1901, and the American Academy of Arts and Science, of which he was a Fellow and to which he gave much time and thought. Society memberships today measure the breadth of a man's interest and give him opportunities for bringing his ideas before the scientific world. Some men are merely "belongers;" others, like Sedgwick, do their full part in promoting the objects of the societies which they join. As Professor Sedgwick advanced in life, his interest changed from one scientific society to another and his scientific papers shifted from the record of detailed studies to educational and philosophical problems. That change marked the normal development of an active, broadening mind. So we may add to Sedgwick's fame as a great teacher that of interpreter of science.

We must next look upon him as a Councilor in Public Health. In 1914 when the State Board of Health was replaced by a Health Commissioner and Public Health Council, Sedgwick was appointed as a member of the Council and served in that capacity until his death. Together the Commissioner and Council constitute the State Department of Public Health. Its work is done partly through committees, and Sedgwick served on the Committee on Sanitary Engineering and was Chairman of the Committee on Food and Drugs. It is difficult to pick out from the many-sided activities of the State Department any particular work which was his, for in one way or another he has been in all of them. He was an ideal councilor. His scientific knowledge, his ripe experience, his grasp of fundamental principles made his advice respected by us all. His facility in writing clear and simple English was most useful to the Council in the preparation of reports. His graceful yet forceful manner of speaking caused him to be chosen on many occasions to represent the Department and whether he spoke before a legislative committee or a large public meeting he was always effective. Many a fight he has had at the State House with anti-vivisectionists, anti-vaccinationists, and various other kinds of antis, but his method of fighting was merely to state his side of the case, simply and forcefully, letting his opponent have a monopoly of the fireworks. It was perhaps one of his faults that he was not aggressive enough. But on occasions he became eloquent. Last year at the Brussels Conference of public health officers, representatives of various nations, gorgeously arrayed in uniform, had been following the conventional lines of such

gatherings before a somewhat restless audience when Sedgwick's turn came. He was there to represent the American Public Health Association, Harvard University, the Massachusetts Institute of Technology, and the U. S. Public Health Service. Simply dressed in his academic robes, he arose and spoke for ten minutes. He praised brave little Belgium and faithful France for saving the world; he gave to England the credit of being the father of public health administration; and then he spoke for America. I do not know what he said for I was not there, but I have been told that the audience went wild in applause and that scores of people, including our own Ambassador, went forward after the meeting to shake his hand. It was the climax of the convention.

As early as 1902 Professor Sedgwick was elected a member of the Advisory Committee of the U. S. Public Health Service, and for nearly twenty years he maintained this connection with national public health affairs. When after the war a reserve organization was created in this service, he was commissioned as Assistant Surgeon General. A few years ago he was made a member of the International Health Board, supported by the Rockefeller Foundation, and thus his interests became world-wide in their scope. Last year he went to England as Exchange Professor from the Massachusetts Institute of Technology to the Universities of Cambridge and Leeds, and on the eve of his departure a newspaper headline very fittingly characterized him as "Ambassador of Health."

During the past few days I have been reading over a list of the titles of the books and most important scientific papers which Sedgwick wrote between the years 1883 and 1921, about a hundred in number. If his minor writings had been included, the list would have been several times as long. Towards the end of his life he wrote less. Only a few weeks before his death he said to me: "I sometimes get sick of talking about health; every Tom, Dick and Harry is now talking about it, and most of what they say is so exaggerated that it casts discredit on all of us who are trying to speak within the bounds of sanitary science." And I wish to take this occasion to express my own views that just as there is danger that scientific research may be organized to death, so there is danger that public health education be organized and legislated, propagandized and commercialized to the point of nullification.

There is a feature of it, however, the concerted movement, largely of the women, to improve the health of children, that strikes a responsive chord in all our breasts. We know that Professor Sedgwick's voice was to be uplifted in favor of this week's crusade.* His heart went out to the refugee children of France, and one of the most beautiful episodes of his life was associated with Chateau Lafayette, which he and Mrs. Sedgwick visited last summer, and to which he had hoped to return.

We come finally to Sedgwick's last great work in connection with the School of Public Health of Harvard University and the Massachusetts Institute of Technology. This school he helped to establish in 1913 and served as Chairman of the Administrative Board until his death. He delighted to see it grow; he delighted to see students coming to it from foreign countries, — from Italy, from China, from South America, from India and Siam, from Czecho-Slovakia, and from Mexico. Few people of Boston realize how solidly this little school has taken its place as a center of public health education, or how its example has been followed by other universities in America.

Nearly twenty years ago when Sedgwick joined the American Public Health Association, he was made a member of a committee on the Teaching of Hygiene and the Granting of the Degree of Doc-

*This address took the place of one which was to have been given by Professor Sedgwick, in inaugurating a Children's Week in Boston.

tor of Public Health. He always held the view that the public health service was different from the medical service, that a man could be an efficient health executive without being a doctor. His last important address, given at the 100th anniversary of the Medical School of the University of Cincinnati, was devoted to the subject of the education of health executives. He advocated what he called the Y plan, by which medical schools should have two programs, alike during the first year, but afterwards diverging, one towards the degree of Doctor of Medicine and one towards the degree of Doctor of Public Health.

His last act as a member of the Administrative Board of the School of Public Health, held December 19, 1920, was to assist in preparing a statement relative to the future of the school, planning for reorganization of its government and doing so at the sacrifice of his own position as Chairman, having in mind only the future good of the cause of public health education. In time to come Sedgwick's part in the organization of this school, which seems destined to take its place side by side with the Harvard Medical School, will stand forth as one of his most constructive works.

And so we may sum up Professor Sedgwick's life as that of a great teacher, an interpreter of science, a wise councilor, an ambassador of public health. Friend of young men, loyal supporter of the Institute, patriotic citizen, a Christian gentleman, he will be greatly missed by all who were fortunate enough to know him.

On Sunday mornings I like to hear the student choir singing in the chapel. Sometimes the music rises and falls in varying melody until at the end it fades away as in a distance. At other times it pursues a simple motiv, which grows in volume until it culminates in a burst of song, and, on a sudden, ceases. For an instant the air tingles and is still. But the memory of the glorious chord goes with us through the day "to charm, to strengthen, and to teach." Thus it was that Professor Sedgwick lived and died and stays forever in our hearts.

GEORGE CHANDLER WHIPPLE.
Harvard University, Cambridge, Mass.

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BOOKS AND REPORTS REVIEWED

Exophthalmic Goitre and Its Non-Surgical Treatment. *Israel Bram, M. D., St. Louis: C. V. Mosby Co., 1920. Pp. 438. Price, $5.50.*

This book of 400 pages deals in a fairly comprehensive way with the thyroid gland and with exophthalmic goitre. The theories of the physiology and the methods of study have been summarized in a general compilation, which is quite full, but which has the distinct disadvantage of not estimating the relative value of the investigating work of others. The literature on the thyroid gland is so full of poor work as well as good, that in order to be of service any book on the subject must differentiate most carefully between the work which is true and that in which the conclusions do not bear close scrutiny. This is particularly true in work which deals with the interrelationship of the glands of internal secretion.

Dr. Bram has done a very good piece of work in the chapters on the non-surgical treatment of thyroid disease, and these chapters are full of excellent advice and of suggestions which are both practical and beneficial. There are many who now think that this field of treatment should be used to far greater extent than has previously been done.

JOSEPH C. AUB, M. D.

Life. *A Study of the Means of Restoring Vital Energy and Prolonging Life. By Serge Voronoff. Evelyn B. Voronoff, translator. New York: E. P. Dutton & Company, 1920. Pp. 160. Price, $3.50.*

This book treats of certain experiments and possibilities in the field of Opotherapy, particularly of the transplantation of testicles. There is an introductory discussion of internal secretions and of the causes of the senile decline. This is followed by an account of various cases of grafting the gonads upon the bodies of castrated or enfeebled animals with advantageous results. The rejuvenation of aged rams effected by testicular grafts has certainly been impressive. Corresponding benefits for the human being are confidently predicted. The author asserts that the testicles of apes will answer well for the purpose.

The presentation is semi-popular and rather scant. It is Gallic in its enthusiasm and picturesqueness, often uncritical but always stimulating. The translation leaves something to be desired. The reader may be puzzled by the frequent mention of "conjunctive cells" but he will discover in time that the reference is to cells of connective tissue. PERCY G. STILES.

✣

Cleveland Hospital and Health Survey. *Cleveland, Ohio: Cleveland Hospital Council. 11 parts, pamphlets. Pp. 1082. Price, $5.50 plus postage; single parts 50 cents each plus postage.*

Private health agencies and civic organizations interested in promoting the public health have often led the way to advances or improvements in the conditions affecting the public health in American communities. The work of the International Health Board against malaria and hookworm, the Community Health and Tuberculosis Demonstration in Framingham fostered by the Metropolitan Life Insurance Company, and the public health surveys initiated and directed by the Oklahoma Public Health Association are examples of the activities of private health agencies. Recently Cleveland has had a thorough examination of the factors affecting the health of the community, and here too, the undertaking was fostered and conducted by a private health agency. On October 3, 1919, the Cleveland Hospital Council arranged for the survey. The investigation was placed under the direction of Dr. Haven Emerson, and work was begun November 9, 1919. It was completed in July, 1920, and the report was submitted on September 22, 1920. The total cost of the survey, including the publication of the report is estimated at $53,000.

The investigation was thoroughly organized and was conducted with adequate publicity. As a result, Dr. Emerson reports that many of the recommendations which were made have already been adopted. This survey also had the advantage of the coöperation of many important national organizations interested in different aspects of public health. Many local organizations in Cleveland and several state organizations in Ohio, also aided. In certain instances these various organizations contributed to the survey not only by loaning expert workers, but also financially.

The survey report consists of 11 parts. Part one deals with the problem of general sanitation. This includes a study of the water supply, sewage disposal, street cleaning, the collection and disposal of refuse, housing, flies and mosquitoes, and the smoke nuisance. It also includes a discussion of the population, topography and climate. Dr. Louis I. Dublin was in charge of the study on vital statistics.

Part two, which considers the organization and activities of the public and private health agencies, is an exhaustive and excellent diagnosis of the situation. The work of the various bureaus of the Cleveland Department of Health was studied and recommendations made for increasing their activities and usefulness. In addition the work of the Anti-Tuberculosis League, the Visiting Nurses' Association, the Day Nursery, the Hospital Council, the Associated Charities and other community organizations was reviewed. Recommendations were made in each case, and agencies for the prevention and relief of heart disease, and the prevention and cure of cancer were proposed.

Part three which deals with the problem of child health was under the direction of Dr. Josephine Baker. Part four, dealing with tuberculosis, was under the direction of Dr. Donald B. Armstrong. Part five, dealing with the venereal disease problem, was under the direction of Dr. W. F. Snow

and his associates from the American Social Hygiene Association. Part six takes up the problem of mental diseases and mental deficiency. This work was under the direction of Dr. Thomas W. Salmon. Part seven considers the problem of industrial hygiene and sanitation, and the employment of women and children in industry. This part of the survey was under the direction of Dr. Wade Wright. Part eight considers the problem of education in medicine, dentistry and pharmacy, and the practice of these professions. This part of the study was made by Dr. Haven Emerson. Part nine deals with the entire nursing problem and considers the education of nurses, the work of the private duty nurse, the work of the public health nurse and the organization of the various forms of nursing activity. This part of the survey was under the direction of Josephine Goldmark, who was assisted by Anne H. Strong, Elizabeth G .Fox, Anna M. Staebler and others.

Part ten is a long and complete report on the subject of hospitals and dispensaries. This work was conducted under the direction of Dr. Michael M. Davis, Jr. In addition to the ten parts of the survey report proper, a bibliography on surveys was also published as part 11. This is doubtless the most complete compilation of surveys which has ever been printed.

The survey is undoubtedly the most complete and the best that has ever been made. One of the features of the study was that specific recommendations for improvement were made in every phase of the investigation. The community therefore has a program for future work, based on the careful diagnosis of experts. Cleveland is to be congratulated for its far-seeing wisdom not only in having the survey, but also in placing the investigation in the hands of recognized experts, trained in the science of public health. Cleveland is also to be congratulated for its splendid community spirit and civic pride which made such a study possible.

MURRAY P. HORWOOD, M. S.

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Nerves and the Man. *W. Charles Loosmore. New York: George H. Doran Company, 1921. Pp. 223. Price, $2.50.*

One's first impression is that this book merely adds another volume to a large group dealing with obvious matters of nerve hygiene. But it proves to possess a real distinction. This is partly due to an unusual grace of diction, but not less to the wise choice of material, the temperate judgment and the sane emphasis characterizing the whole. The author's personality makes an exceedingly strong and pleasing impression. He has large resources of scholarship and he draws upon them discreetly, sharing his treasures with his reader and preserving always an atmosphere of kindliness. Most refreshing is the specific nature of all his suggestions; he does not repeat platitudes and generalities but has the most homely and practical advice for every situation.

PERCY G. STILES.

✣

Hygiene of Communicable Diseases. *A Handbook for Sanitarians, Medical Officers of the Army and Navy and General Practitioners. Francis M. Munson, M. D., Lieutenant, Medical Corps, U. S. N. (Retired.) New York: Paul B. Hoeber. 1920. Pp. 793. Illustrated. Price, $5.50.*

This volume presents in a concise and readily accessible form the information now available concerning the epidemiology and the management of the communicable diseases.

The author's experience as a medical officer and sanitarian in different parts of the world has made him realize that in practical work one cannot read over long stories in order to refresh his memory on the fundamentals of sanitary science. Consequently, the value of the book has been greatly enhanced because of the fact that the various phases of communicable diseases have been separated (in Part II) into carefully headed sections and sub-sections so that the reader may obtain quickly the information sought on any particular major point.

The plan of the Committee on Standard Regulations of the A. P. H. A. has been followed out by the author.

There is very little material in the book that is new, but its methods of presentation thoroughly justify its existence. As all statements are supported by competent authorities, it becomes a trustworthy volume for the library of the physician and the health officer.

CLARENCE D. HART.

Scurvy: Past and Present. *Alfred F. Hess, M.D., Clinical Professor of Pediatrics, University and Bellevue Hospital Medical College, New York City. Philadelphia: J. B. Lippincott Company. 1920. Pp. 279. Illustrated. Price, $4.00.*

Interest in scurvy has been stimulated the last few years as the result of a new and broader conception of nutrition. Also the World War tended to demand a renewed consideration of the subject which has been treated by Dr. Hess in a most literary manner.

The last comprehensive treatise on scurvy in English was published by Lind in 1772, and for the benefit of the clinician, hygienist and biological chemist, the recent advances have been gathered into one volume.

Dr. Hess has not failed to take advantage of his favorable opportunity, and the book never lacks interest, from the picturesque material of the historical introduction to the closing discussion of the relation of scurvy to other diseases. It is readable throughout, and can be warmly recommended as an enjoyable as well as a profitable piece of medical reading for physicians and public health officials. All features of the disease are considered and a full bibliography assures the book a place in every good library.

CLARENCE D. HART.

ASSOCIATION NEWS

LIST OF NEW MEMBERS

Proposed for Election to the

A. P. H. A.

February 10 to March 4, 1921, inclusive.

Names of Sponsors are set in **Bold Face Type.**
Names of New Members are set in Light Face Type.

ALABAMA

George Hazlehurst, Montgomery.
F. W. Dershimer, M. D., Director, County Health Work, Montgomery.

CONNECTICUT

Stanley H. Osborn, M. D., Hartford.
W. C. Deming, M. D., Health Officer, Wilton.
J. R. Harris, M. D., New Britain, and Prof. Frederic P. Gorham, Providence, R. I.
Abraham Thomas, Bacteriologist, Health Dept. Lab., New Britain.

GEORGIA

Mrs. Ada H. Latham, Atlanta.
Hortense E. Marion, R. N., Atlanta.

ILLINOIS

John Ritchie, Jr., Boston, Mass.
E. W. Kocher, Jr., Elgin.

IOWA

John Ritchie, Jr., Boston, Mass.
Jane Boyd, Social Worker, Tyler School, Cedar Rapids.

LOUISIANA

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Willis P. Butler, M. D., Lab., City & State Boards of Health, Shreveport.

MAINE

John Ritchie, Jr., Boston, Mass.
Maine Public Health Assn., Atten. Hilda L. Ives, Exec. Sec., Augusta.

MARYLAND AND DISTRICT OF COLUMBIA

John Ritchie, Jr., Boston, Mass.
Juan C. Segovia, M. D., Dir., Laboratory of San Salvador, Baltimore.
W. E. Hardenburg, Washington.
Louva G. Lenert, Asst. Sanitary Engineer, U. S. P. H. S., Austin, Texas.

MASSACHUSETTS

Elizabeth M. Fennessy, Boston.
Alice G. Bryant, M. D., Ear, Nose and Throat Specialist, Boston.
Eugene R. Kelley, M. D., Boston.
Department of Public Health, Atten. of Miss Cole, Librarian, State House, Boston.
John Ritchie, Jr., Boston, Mass.
Federated Jewish Charities of Boston, Atten. of Mr. Ben Rosen, Boston.
M. P. Horwood, Cambridge.
Florence L. Meredith, M. D., Assoc. Prof. Hygiene & Dir. Dept. Women's Med. College of Pa., Philadelphia, Pa.

NEW YORK

Charles A. Bentz, M. D., Buffalo, and Prof. Frederic P. Gorham, Providence, R. I.
Carl O. Lathrop, Bacteriologist & Serologist, Univ. of Buffalo Med. School, Buffalo.
Prof. R. A. Chaddock, New York.
Mrs. Lee Bernheim, Health Education, New York.
John Ritchie, Jr., Boston, Mass.
Frederick F. Russell, I. H. B., New York.
Gerald Morgan, New York.

NORTH CAROLINA

J. Howell Way, M. D., Waynesville.
J. R. Miller, M. D., Health Officer, Rock Hill.

RHODE ISLAND

Prof. Frederic P. Gorham, Providence, and Charles A. Bentz., M. D., Buffalo, N. Y.
Carl O. Lathrop, Bacteriologist, Buffalo Med School, Buffalo, N. Y.
Prof. Frederic P. Gorham, Providence, and J. R. Harris, M. D., New Britain, Conn.
Abraham Thomas, Bacteriologist, Health Dept. Lab., New Britain, Conn.

TENNESSEE

J. P. Kranz, Nashville.
J. Walter McMahan, M. D., City Health Officer, Alcoa.

TEXAS

A. W. Hedrich, Boston, Mass.
Manton M. Carrick, M. D., State Health Officer, Austin.

VERMONT

H. A. Eliot, M. D., Manchester.
J. S. Horner, M. D., West Pawlet.

WYOMING

C. Y. Beard, M. D., Cheyenne.
Homer R. Lathrop, M. D., Pres. Wyo. State Medical Society, Casper.

CUBA

Dr. Jorge Le Roy, Havana.
Francisco M. Fernandez, M. D., Member Leprosy Comm., Havana.

FOREIGN

John Ritchie, Jr., Boston, Mass.
Hernan Vigil & Co., Atten. of Mr. Hernan Vigil, Valparaiso, Chile.

STANDARDIZATION OF PUBLIC HEALTH TRAINING

Report of the Committee of Sixteen*

The committee of sixteen appointed by the President of the American Public Health Association under authorization of the Executive Committee, at the time of the annual meeting in New Orleans in 1919, respectfully submits the following report:

The committee has been duly cognizant of the belief of the Board of Directors expressed when the Committee was created, that the tasks of Public Health administration require a standardized professional training which will adequately prepare for positions in the public health field, and that the possession of such training should be indicated by duly recognized and accredited degrees. With this belief the Committee is in cordial agreement.

In approaching its task the Committee has first of all attempted to obtain a fairly complete conception of what is at present being accomplished in the training of men and women for administrative positions in public health. In order to secure a list of all the schools of public health now in operation in the United States and Canada, a letter was sent to each of the state and provincial health officers and we are happy to acknowledge the generous response to our request for information, practically every one of the officials having replied with promptness to our inquiry. Information in regard to the work of each school was then obtained by direct correspondence and the results, summarized in Table 1 below, present, we believe, a reasonably complete picture of the present status of public health education in North America. Many other institutions than those listed, of course, train chemists, bacteriologists, engineers, nurses and physicians who later enter the public health field, but we have been concerned only with schools which aid directly to prepare workers in the administrative aspects of public health.†

The variety of degrees and certificates granted in this field, as well as the diversity of requirements for the same degree, are indicated in summary form in Table 2. This table clearly indicates the need for a movement toward standardization, such as the Directors of the American Public Health Association have asked us to consider.

It should be noted that a beginning has already been made in the task of standardizing degrees in public health in the shape of a conference called at Yale University early in 1919 which brought together representatives from certain Eastern universities particularly interested in the subject. Johns Hopkins University was represented by Dr. W. H. Welch, the Massachusetts Institute of Technology by Prof. W. T. Sedgwick, Harvard University by Dr. M. J. Rosenau, New York University by Dr. W. H. Park, and the University of Pennsylvania by Dr. H. F. Smyth; while Yale University was represented by a special committee from the Graduate School, including Prof. S. E. Barney, Prof. L. B. Mendel, Prof. L. F. Rettger, Prof. M. C. Winternitz, and Prof. C.-E. A. Winslow.

After very full discussion of the various points involved the following resolutions were unanimously adopted:

"1. That the degree of Doctor of Public Health (for which the abbreviation should be Dr. P. H.) for graduates in medicine should normally be awarded after two years of work done under academic direction, of which one year at least should be in residence; and that the requirements for the degree should include class work, practical field work, and an essay based on individual study of a particular problem.

"2. That the degree of Doctor of Philosophy or Doctor of Science in Public Health or Hygiene should be conferred upon students who hold the bachelor's degree from a college or technical school of recognized standing, and have satisfactorily completed not less than three years of graduate study. It is understood that this degree is based upon the fundamental sciences associated

*This Report was presented at General Sessions of the American Public Health Association at San Francisco, Cal., September 16, 1921. By vote of the meeting it was re-referred to the same Committee for final action at the next annual meeting.

Reprints of this Report may be purchased on application to the Office of the Association, 169 Massachusetts Avenue, Boston 17, Mass. Price 10 cents, with special figure for quantities.

†An earlier survey of the status of public health education was presented by Dr. E. C. Howe in the American Journal of Public Health for August, 1918; and partial data have been presented for several years by the Council on Medical Education of the A. M. A. (See *Journal of the A. M. A.*, August 7, 1920.)

PRESENT STATUS OF PUBLIC HEALTH EDUCATION

TABLE 1.
Data as of 1920

Degree	School Giving Degree	Time Required	Previous Training	No. Grad. Last Class	No. of Instructors
Gr. P. H.	Univ. of Cal.	4-year course	Equivalent to Junior standing	In all three courses 10	20
Gr. P. H.	Univ. of Cal.	2-year course	College of Civil Engineering		20
M. D. & Gr. P. H.	Univ. of Cal.	1½-year course	3½ years of medical course		20
Dr. P. H.	Univ. of Col.	2 years	Bachelor's degree from approved college	Courses discontinued in 1918	
M. S. in P. H.	Univ. of Col.	1 year			
C. P. H.	Univ of Col.	4 years			
Dr. P. H.	Yale University	2 years	Medical degree	2	Staff
C. P. H.	Yale University	1 year	Bachelor's degree or 2 years' medical	2	
Ph. D.	Yale University		Bachelor's degree with medical and public health subjects		
Dr. P. H.	Chicago Hospital College of Med.	36-hour course	No recent data available.		
Dr. P. H.	Tulane University	Not longer than 3 years	Degree from approved medical school or equivalent Medical degree	Courses discontinued in 1918	
Diploma in Tropical Medicine & Hygiene	Tulane University				
Dr. P. H.	Johns Hopkins Med. School	2 years	Bachelor's degree and medical degree or combined med. and public health course—5 years.	In all courses 35	40
Dr. of Science in Hygiene	Johns Hopkins Med. School	3 years	Bachelor's degree with physics, chem., biology, med. sciences		40
B. of Science in Hygiene	Johns Hopkins Med. School	2 years	2 years approved four colleges, with physics, biology, inorganic and organic chemistry.		40
C. P. H.	Johns Hopkins Med. School	1 year	Degree in Medicine or in Arts and Sciences with training in physical and med. sciences.		40
Dr. P. H.	Harvard Medical School	2 years	Degree in Medicine	2	40
C. P. H.	Harvard & Technology	1 year	2 years approved medical school, Bachelor's degree, or special experience in P. H. work with physics, chem., biol., etc.	10	40
Dr. P. H. in Ind. Hygiene	Harvard Medical School	2 years	Medical degree		40
Ph. D.	Harvard University	3 years	A. B. or B. S.	None	Staff
C. P. H. in Ind. Hygiene	Harvard & Technology	1 year	Medical degree		40
B. S.	Mass. Inst. of Technology	4 years	Entrance exams.	8	Staff
M. P. H.	Detroit College of Med. & Surg.	1 year	Graduates of approved med. school	None	10
M. of Science in P. H.	Univ. of Mich. Med. School	1 to 2 years	Bachelor's or Medical degree	None	10
Dr. P. H.	Univ. of Mich. Med. School	2 to 3 years	Bachelor's or Medical degree	None	10
Dr. P. H.	N. Y. Univ. & Bellevue Hosp. Med. College	2 years	Graduates of approved med. school	None	30
C. P. H.	N. Y. Univ. & Bellevue Hosp. Med. College	Indefinite (May be by corres.)	Health officers or college graduates	25	30
Certificate	Syracuse Univ.	Special courses for health officers to meet requirements of New York State.			
Certificate	Albany Med. College	6 weeks corres. and 1 week attend.	Medical degree or experience as health officer		

Degree	School Giving Degree	Time Required	Previous Training	N. Grade Last Class	No. of Instructors
M. S. in P. H.	Ohio State University	1 year	Bachelor's degree or medical degree		
C. P. H. Nursing	Ohio State University	1 year	Trained nurse		
Dr. P. H.	Univ. of Pa.	2 years	Medical degree	1	19
Certified Sanitarian	Univ. of Pa.	1 year	Graduates of Arts or Sciences	4	19
M. P. H.	Univ. of Wis.	1 year	Medical degree	None	8
Dr. P. H.	Univ. of Wis.	2 years	For physicians	None	8
	McGill Univ., Montreal	Data not available			
	L'Université Laval, Quebec	Data not available			
D. P. H.	L'Université de Montreal	1 year	Medical degree		
D. P. H.	Queens Univ., Kingston, Canada	3 to 6 mos. in different subjects	Bachelor's degree and medical degree		
D. P. H.	Univ. of Toronto	1 winter and 1 summer	Medical degree from approved school		
D. P. H.	Western Univ., London, Canada	8 mos. winter and 3 mos. summer	Medical degree or 4th year complete men who elect D. P. H. for 5th year	None	

with hygiene and public health, including a knowledge of physics, chemistry, general biology, anatomy, physiology, physiological chemistry, pathology and bacteriology, in addition to the thesis and other usual requirements for the Ph.D. or Sc.D. degree.

"3. That the Certificate in Public Health should be granted for not less than one academic year of work to those who have received a bachelor's degree from a recognized college or technical school, or have satisfactorily completed two years of work in a recognized medical school, provided they have previously pursued satisfactory courses in physics, chemistry, general biology and general bacteriology.

"4. That the degree of Bachelor of Science in Public Health or Hygiene should be given for the completion of a four years' course, the last two years of which have been devoted to the fundamental sciences associated with hygiene and public health.

"5. That the authorities having the appointment of health officials be urged to give preference so far as possible to persons holding degrees or certificates in public health or hygiene."

It seems reasonably clear that the Yale conference has correctly interpreted the general trend of educational policy in recognizing two types of courses in public health: one, a course of a single year leading to the Certificate in Public Health or the Master of Science in Public Health; and one, a longer course, leading to the Doctorate in Public Health, which should clearly constitute the highest degree in this special field.

It seems generally agreed that the requirement for the Certificate in Public Health or the Master of Science in Public Health should be the completion of the ordinary course for the Bachelor's degree, and there is reasonable agreement among the better institutions that the degree of Doctor in Public Health should require at least two years of work in residence. There is a marked difference, however, as to the question whether the degree of M.D. should be a prerequisite for the Dr. P. H. In other words, the matter may be formulated as follows: The first degree, or Certificate in Public Health, should evidently represent five years of work in addition to high school graduation, the general cultural work of the college with a beginning of specialization to be included in the first four years and the fifth year to be devoted exclusively to public health. It is believed by many that the degree of Doctor of Public Health should represent a six years' course in addition to high school, four years of college, with a beginning of specialization in biology, physiology and bacteriology, with two

years devoted to specialization in public health; while the conclusions of the Yale conference would require at least eight years from the high school, two years of college pre-medical work, four years in the medical school, and two years of graduate study.

The most serious defect in the whole system at present, however, lies in the fact that certain institutions give not only the Certificate in Public Health but even the Doctorate in Public Health for a course of a few weeks, while others require a period of almost three years, and it seems most desirable to effect some form of standardization in this field.

TABLE 2

Degree—	No. of Schools Giving Degree	Time Required
Bachelor of Science in Hygiene	1	2 yr.
Bachelor of Science in Public Health	1	4 yr.
Certificate	1	7 wk.
Certificate	1	Indefinite
Certificate in Public Health	3	1 yr.
Certificate in Public health	1	Indefinite
C. P. H. in Industrial Hygiene	1	1 yr.
C. P. H. in Nursing	1	1 yr.
Certified Sanitarian	1	1 yr.
Diploma in Public Health	1	3-6 mos.
Diploma in Public Health	2	1 yr.
Diploma in Public Hygiene	1	1 yr.
Diploma in Tropical Medicine & Hygiene	1	1 yr.
Doctor of Philosophy in Public Health	2	Indefinite
Doctor of Public Health	1	36 hr.
Doctor of Public Health	7	2 yr.
Doctor of Public Health	1	2-3 yr.
Dr. P. H. in Industrial Hygiene	1	2 yr.
Doctor of Science in Hygiene	1	3 yr.
Doctor of Science in Public Health.	1	3 yr.
Graduate in Public Health	1	1½-4 yr.
Master of Arts in Public Health	1	1 yr.
Master of Public Health	2	1 yr.
Master of Science in Public Health.	2	1 yr.
Master of Science in Public Health.	1	1-2 yr.

The final opinions of the Committee upon these problems may be summarized in order, as follows:

1. The Committee is agreed that the first degree in Public Health should be a Certificate in Public Health, a Master of Science in Public Health, or Master of Public Health, to be granted for one or two years of postgraduate work, following a college course in which the beginning is made in specialization along biological lines. If this undergraduate specialization has included adequate courses in zoology, botany, bacteriology, vertebrate anatomy, histology, embryology, physics, and chemistry, the degree may be granted for less than two years' work, but in no case is less than one year of work in residence to be required.

2. It is agreed by the Committee that the highest degree in Public Health should be a Dr. P. H., to be granted for not less than two years of work in academic residence. Students in this course must have either the Bachelor's or Medical degree or have satisfactorily completed two years in an approved medical school which requires two years of college or pre-medical work. For students holding the Bachelor's degree, who have not had in addition to the undergraduate subjects mentioned under paragraph 1, the equivalent of at least a full year's work in public health subjects, three years of study in academic residence shall be required. These requirements would make the Dr. P. H., like the M. D., attainable in six years of study after graduating from high school by those students who specialized in their undergraduate years. On the other hand, students who complete their medical course first will in eight years have gained both their Doctorate in Medicine and their Doctorate in Public Health. Some schools will no doubt continue to follow the lines laid down by the Yale conference and admit only medical graduates while other will continue to admit college graduates having proper preparation. This difference in policy seems at present to be unavoidable; and it need not be a serious one if the work actually required during the years of study for the Dr. P. H. degree be the same in either case.

3. The Committee believes that the attempt should be made to standardize the work of the one-year course in Public Health (whether the degree to be granted is called a Certificate in Public Health, a Master of Science in Public Health or a Master of Public Health) and the work for the Doctorate in Public Health, and to specify in part at least the work that should be completed before they are conferred.

4. The Committee does not deem it desirable to attempt to standardize any other Public Health degrees at this time.

5. The Committee believes that a Council of Public Health Education should be created by the American Public Health Association, similar in general functions to the Council on Medical Education of the American Medical Association. For the present at least the work of such a Council would necessarily be on a relatively modest scale.

and could be conducted without the expense of elaborate administrative machinery.

Recommendations

1. The Committee therefore recommends the formal approval by the Association of the general standards for the Certificate, Master, or Master of Science in Public Health and the Doctorate in Public Health as described above.

2. The Committee recommends the adoption of an amendment to the Constitution creating a Council of Public Health Education similar to the Council on Medical Education established by the American Medical Association. For the attainment of this end the Committee recommends the following addition to the Constitution and By-Laws of the Association:

"The Council on Public Health Education shall consist of five members, to be appointed by the President and confirmed by the Executive Committee.

"Immediately after the adoption of this by-law, one member shall be appointed to serve for one year, one for two years, one for three years, one for four years, and one for five years. Thereafter one member shall be appointed each year to serve for five years.

"The Council shall organize, elect a Chairman and Secretary, and shall adopt such regulations for the government of its actions as it deems expedient. The Council shall have power to appoint in the name of the Association special committees to coöperate and assist in special phases of its work. It shall expend money or contract financial obligations only as shall be authorized in writing by the Executive Committee.

"The functions of the Council on Public Health Education shall be:

1. To make an annual report to the Board of Directors on the existing conditions of public health education in the United States.

2. To make suggestions as to the means and methods by which the American Public Health Association may best influence favorably public health education.

3. To act as the agent of the American Public Health Association (under instructions from the Executive Committee) in its efforts to elevate public health education."

Respectfully submitted,

DR. A. C. ABBOTT
DR. MARK BOYD
DR. L. D. BRISTOL
DR. W. H. BROWN
DR. J. C. GEIGER
MR. SAMUEL A. GREELEY
PROFESSOR E. O. JORDAN
DR. ARTHUR I. KENDALL
DR. R. T. LEGGE
DR. W. H. PARK
PROFESSOR M. J. ROSENAU
PROFESSOR W. T. SEDGWICK
PROFESSOR C. E. TURNER, Secretary.
DR. VICTOR VAUGHAN
DR. WILLIAM H. WELCH
PROFESSOR C.-E. A. WINSLOW, Chairman.

□

REPORT OF COMMITTEE ON RETAIL DISTRIBUTION AND MARKETING OF FOODS

Presented to the Food and Drug Section, American Public Health Association, at San Francisco, Cal., September 16, 1920.

This period of reconstruction, with the world-wide scarcity of foods, places new responsibilities upon food officials in readjusting former methods and educating the public in the increasing necessity for food conservation. To emphasize the importance of the adequate distribution and the economical marketing of foods, it seems advisable to include in this report connecting phases which have a significant bearing on the subject.

Investigation has shown that the scarcity and high price of certain staple foods have resulted in many instances in changes in the diet which are not conducive to maintaining the body at its normal efficiency. This tendency is very marked in the industrial centers, while the statistics from school authorities show that malnutrition in children of the medium and well-to-do classes is greatly on the increase, this being due not to insufficient food, but improper diet.

The Town of Brookline, Mass., has met this situation in a manner that might be

valuable to other municipalities. The authorities there have created the office of Municipal Dietitian and established a Food Center well equipped for demonstrating purposes. Instructions are given in selecting and purchasing foods, the proper diet for school children and adults, and what is extremely important to the health of the community, assistance is given in prescribing a dietary correction for diseases and cases of malnutrition.

It is a question if our manufactured foods are not too largely centralized and our production too largely specialized. With the greatly increased freight rates, high cost and scarcity of labor, a return to the use of community grist mills and slaughtering houses might prove a progressive rather than an obsolete factor in solving certain phases of the situation. While we realize the economical advantages in having our food manufactories in or near the centers of production and in specializing in the manufacture of certain products, it is apparent that in the cases of many commodities we have carried it beyond the point of practicability. When we find farmers shipping their hogs four hundred to six hundred miles to market and buying their dressed pork from local dealers, and large dairying districts where hardly a producer can be found who does not buy his butter from the local grocer, we have a situation that calls for constructive action rather than comment.

Known instances of profiteering in certain foodstuffs, and it should be added, accusations not founded on facts, have led to a general desire by health and food officials for Federal supervision or control of the food supply. The question should be carefully studied in the light of recent experiences, in order to ascertain if we really want Federal control of our food supply or Federal control of speculation. The latter would allow the unwritten law of supply and demand to function unhampered and would seem to be the most practical solution. When capital is so freely used to hold and re-sell food products, making fortunes for investors at the expense of consumers, as has been the case with sugar, it is time for such organizations as ours to take concerted and vigorous action to bring relief.

The standard of living in this country is the highest in the world. The choicest cuts of meat, the flour from the white portion of the grain, and in fact the most perfect specimens of food are demanded, while other portions would be more economical and often more nutritious. The sharp increase in the salaries of wage earners has encouraged their tendency to maintain standards which, but a few years ago, only the rich could afford. Many by-products are not being utilized, for esthetic reasons only. A glaring example of this is the enormous loss of the food value of skimmed milk. In some milk-producing territories thousands of quarts daily are turned into the sewer, largely because efforts have failed to increase the use of cottage cheese. One large creamery company has but partially solved the problem by converting it into pork, but the muscle and tissue building properties of skimmed milk should be conserved for direct human consumption.

From a sanitary viewpoint a more rigid medical examination of food handlers under supervision of health officials should be insisted upon. The sanitary conditions, especially in the smaller manufactories such as bakeries and candy kitchens, also cellars and back-rooms where ice cream and other foods are made, are not as a rule as thoroughly supervised as in the larger plants. In some cities women's organizations have recognized this lack of store inspection and are taking steps to fill in the breach. The Women's Municipal League of Boston has just inaugurated a system of store and bakeshop inspection, and has entered upon the undertaking with the full approval of the City Health Commissioner, whose object is to learn from practical experience just how such a body of women may successfully assist already overburdened health departments. The most important feature of such work is the education of a large body of citizens in reasonably sanitary methods in handling and serving food. A woman's organization naturally reaches the domestic conditions which are seldom adequately covered by health officials, and it is evident that their work would be of great value when rightly functioned in coöperation with Board of Health. It is suggested that such organized work might well be applied in communities where Boards of Health are inactive or where no food inspection systems exist.

There seems to be a growing tendency

to inspect foodstuffs too largely for esthetic reasons. Retail store keepers are not allowed to expose carcasses in doorways or open windows, certain foods must be kept in dust-proof cases, stores must be kept clean and free from refuse, while rooms where food is manufactured and the materials of which it is composed often receive too little attention. This may please the taxpayer and is more or less necessary, but should be made an auxiliary for a more thorough-going inspection system founded solely upon the protection of the public health.

One of the most serious menaces to the public health in connection with our food supply is the insanitary condition existing in the rail transportation of milk and cream. Recent investigation in the New England states has shown practices and methods to be in use which should not be tolerated. Milk trains often hours behind schedule with the product waiting on platforms in the hot sun; lack of sheds or other protection for milk at receiving stations; insufficient ice with inadequate distribution in cars; no attempt at icing on short hauls; destruction and contamination of cans through misuse by railroad employees are some of the most habitual and serious defects noted. The economic loss from spoilage is enormous, and when we consider the care given other perishable but less susceptible foodstuffs purely for economic reasons, we wonder that refrigerator cars were not long ago adopted for the transportation of milk and cream in any considerable quantity over long hauls. In most of the larger cities the supply must necessarily come through interstate shipments, and consequently its care in transportation comes under the control of the Interstate Commerce Commission under its ruling of July 11, 1916, which simply states that the cars shall be "heated in winter and iced in summer," with no specifications as to outside temperature, amount of ice or heat to be used, or train schedules.

This Committee criticizes the Interstate Commerce Commission for its seeming indifference to the health of the public in the failure to provide adequate regulations to protect a product so easily infected, but so vitally essential in the conservation of human life.

This matter was brought to the attention of the American Public Health Association last year. The International Association of Dairy and Milk Inspectors has done some constructive work, and has a representative at Washington whose business it is to present specific cases of insanitary conditions and spoilage to the Interstate Commerce Commission. We should go further than this and demand regulations that will adequately protect the product, with provisions for their endorsement, though it be necessary for us to carry our case to the President, Congress, to the American people.

In view of the fact that both retail and wholesale distributors of foods generally criticize the cash and carry chain stores as a detriment to the legitimate growth of the trade, the subject has been given consideration from the viewpoint of the consumer. Chain store systems are springing up with great rapidity, and it might be assuring to consumers at least, to state that in the case of reliable concerns we have not found any condition which can justly be criticized as unfair to competitors. They are based upon sound business principles and employ experts on special products as well as for advertising, displaying, and sanitary supervision. This insures more uniformity of quality in their products and service. Many of them manufacture their own food specialties, and as a rule, buy direct from the manufacturers, thereby saving immense sums which otherwise would go to the wholesaler and commission merchant. In addition they are so situated as to be able to buy when the market is low and have no overhead expenses for bookkeeping or losses from bad accounts at their retail stores. This makes it possible for them to undersell other merchants and accrues to the benefit of the consumer and also encourages thrift by requiring customers to buy only what they can conveniently pay for. We have, however, no criticism of the charge and deliver type of stores. These are necessary, for a large portion of consumers demand service for which they can afford to pay.

The North Dakota Agricultural Experiment Station has recently completed a very comprehensive investigation covering the 50 grocery stores in the city of Fargo. The report brings out apparently new economic phases of food distribution which might form a basis for a much-needed reform.

This investigation showed a range in operating expenses from 9 to 52% and implied that 20 well-managed stores were ample to handle the business of the 50 and could operate with an expense of not more than 7.66% for the charge and delivery, and 5% for the cash and carry stores. The report states: "We are firmly convinced that one of the main factors in the present widespread difference between prices received by the producer and what the consumer is forced to pay is lack of proper supervision by the government of the middlemen and the retailers."

We agree with the conclusions reached in the investigation conducted by Wm. N. Ingersoll, that 88 cents of every dollar spent by the consumer represents expenses, and the balance of 12 cents represents profit. Of the 88 cents the producer receives 37 cents; allowing 4 cents for necessary transportation and crating, the balance, amounting to 47 cents goes for additional profits to various handlers. The pertinent points are: (a) Is not this 47 cents an unwarrantable cost in the distribution of food? (b) How can it be eliminated or reduced to a minimum? (c) Should not the producers (tillers of the soil) receive a larger portion? (d) Is such an inequitable division of cost fair to the consumer? The economic conditions of our country demand that we should seek means to eliminate unnecessary profits and wastes in marketing, for we cannot hope to lower the cost of food or provide increased production under present conditions.

In conclusion, the Committee urges the American Public Health Association to take concerted action toward remedying the conditions outlined in this report. Let us put our hands to the plow and furrow deeply, preparing the soil for seed that will ultimately yield an adequate and safe food supply at reasonable prices, thereby promoting the health and welfare of the nation.

WILLARD E. WARD, Chairman.
MRS. WILLIAM MORTON WHEELER,
CHAS. P. MOAT.

CONVENTIONS, CONFERENCES, METINGS

April 5, Nashville, Tenn., State Medical Association of Tennessee.

April 5, Hackensack, N. J., New Jersey State Nurses' Association.

April 12, Clarksburg, W. Va., West Virginia Health Officers' Conference.

April 18-23, Cincinnati, O., Public Health Federation.

April 19-20, Columbia, S. C., South Carolina Medical Association.

April 19-21, Montgomery, Ala., Medical Association of the State of Alabama.

April 19-21, New Orleans, La., Louisiana State Medical Association.

April 25, Pinehurst, N. C., North Carolina State Health Officers' Association.

April 25, Pinehurst, N. C., North Carolina Hospital Association.

April 28, Boston, Mass., Massachusetts Association of Boards of Health.

May 2-5, Brooklyn, N. Y., New York State Medical Society.

May 2-7, Louisville, Ky., Institute for Health Officers and Public Health Nurses.

May 2-7, Louisville, Ky., Kentucky Public Health Association.

May 3-5, Columbus, O., Ohio State Medical Association.

May 4, Rome, Ga., Georgia Medical Association.

May 4, Brooklyn, N. Y., New York State Association of Public Health Laboratories.

May 4-6, Wichita, Kan., Kansas Medical Society.

May 5, Macon, Ga., Georgia Hospital Association.

May 9-10, Indianapolis, Ind., Indiana State Health Association.

May 9-11, Coronado, Cal., California State Medical Society.

May 9-12, Lincoln, Neb., Nebraska State Medical Association.

May 9-12, Skirvin Hotel, Oklahoma City, Okla., Southwest Water Works Association.

May 10-11, Atlantic City, N. J., American Association of Physicians.

May 10-11, Pensacola, Fla., Florida Medical Association.

May 10-11, Laurel, Miss., Mississippi State Medical Association.

May 11-13, Des Moines, Ia., Iowa Medical Association.

May 10-14, Topeka, Kan., Kansas State Nurses' Association and Kansas State Organization for Public Health Nursing.

May 13-14, Boston Public Library, Boston, Mass., Massachusetts Tuberculosis League.

May 16-17, Toronto, Ont., Can., Ontario Health Officers' Association.

May 16-20, Winton Hotel, Cleveland, O., Ohio Hospital Association.

May 17-19, Springfield, Ill., Illinois Medical Society.

May 17-19, St. Joseph, Mo., Missouri State Medical Association.

May 17-19, McAlester, Okla., Oklahoma State Medical Association.

May 18, Toronto, Ont., Can., Canadian Anti-Tuberculosis Association.

May 18-19, Hartford, Conn., Connecticut State Medical Society.

May 19-21, Hot Springs, Ark., Arkansas Medical Society.

May 23-26, Congress Hotel, Chicago, Ill., American Society Mechanical Engineers.

May 24-26, Aberdeen, S. D., South Dakota State Medical Association.

May 25-26, Concord, N. H., New Hampshire Medical Society.

May 31-June 1, Boston, Mass., Massachusetts Medical Society.

May, 1921, Copenhagen, Denmark, Second Regional Conference.

May, 4th week, Pence Springs, W. Va., West Virginia State Medical Society.

June 2, Providence, R. I., Rhode Island Medical Society.

June, 3-5, Boston, Mass., Conference of State Sanitary Engineers.

June 3-5, Boston, Mass., State and Provincial Health Authorities of North America.

June 6-7, Boston, Mass., Association of American Industrial Physicians and Surgeons.

June 6-7, Hotel Mizpah, Syracuse, N. Y., Central New York Public Health Association.

June 6-10, Boston, Mass., American Medical Association.

June 6-10, Boston, Mass., American Medical Editors' Association.

June 6-10, Hotel Hollenden, Cleveland, O., American Water Works Association.

June 8-10, Kentucky State Association Graduate Nurses.

June 9, Burlington, Vt., Vermont Tuberculosis Association.

June 13-17, New York City, National Tuberculosis Association.

June 14-16, Toronto, Ont., Can., American Surgical Association.

June 20-24, Detroit, Mich., American Institute Chemical Engineers.

June 22-29, Milwaukee, Wis., National Conference of Social Workers.

June 24-25, Eklo, Nev., Nevada State Medical Association.

June 28-29, Bangor House, Bangor, Me., Maine State Medical Society.

November 14-18, New York City, American Public Health Association.

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Have you made up your mind about going to New York, November 14-18, for the Fiftieth Annual Meeting of the American Public Health Association?

EMPLOYMENT BUREAU

HELP WANTED

Help wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the 10th of each month for publication on the 20th. Mail to Boston office as early as possible.

In answering keyed advertisements, please mail replies separately to editorial office in Boston, Mass. In replying give age, professional training, salary requirements, previous positions held and three or more references.

Assistant Bacteriologist and Diagnostician for State Laboratory of Hygiene, Concord, N. H. Salary $1,500. Address State Board of Health, Laboratory of Hygiene, Concord, N. H., giving age, references and experience.

Wanted: Resourceful man or woman under the age of forty, with training or experience in public health work for editorial and health educational activities in the East. Salary $2,500 to $3,500 to begin, according to experience and ability. Give age, past experience, and references. Names of qualified candidates from third parties of standing are welcome. Address 436, R. K., care of this JOURNAL, Boston address.

Wanted: Assistant Bacteriologist in State Laboratory in Pacific Northwest. Salary to be $1,500-$1,800, depending upon training and experience. Address 438, L. E. M., care of this JOURNAL, Boston address.

Wanted: Chemist who can do Bacterial Work; also an Assistant Operator capable of handling rapid sand filtration plant which we recently installed at West Palm Beach. Each job will pay $125 per month, and transportation will be refunded after sixty days' satisfactory service. Address 439, H. H. H., care of this JOURNAL, Boston address.

POSITIONS WANTED

Position wanted announcements will henceforth be carried in this column. The charge is $2 per insertion. Copy should be received at this office by the 10th of the month.

A woman physician, having eight years' experience in Public Welfare work of institution, three years' Hospital work and five years' private practice, excellent in Venereal Clinic, would like a position as Public Health Physician, Industrial Work or Resident Physician in Hospital. Address 143, M. L., care of this JOURNAL, Boston address.

Health Officer, Eastern City, desires change in location. Particularly qualified in administrative work. Has also had considerable army sanitary experience. Address 144, H. R. J., care of this JOURNAL, Boston address.

Position wanted by graduate in public health. Five years' experience in city, state and federal health work. Now connected with national private health organization. Good executive, tactful, energetic speaker, writer, result getter. Address 145, T. A. J., care of this JOURNAL, Boston address.

Wanted: Appointment as director of public health education or publicity with state or city health department or private health organization. At present editor of successful state health journal and director of publicity for live wire state health association. State campaign manager for 1921 Christmas seal sale. Thorough knowledge of writing and editing, typography and advertising and sound understanding of public health work and ideals. Address replies to 146, W. K. R., care of this JOURNAL, Boston address.

Wanted: Full time executive and administrative public health position desired in Western city. Have a record for results. Five years in public health. B. S., M. D., Director A. P. H. A. Address 147, K. A. J., care of this JOURNAL, Boston address.

Wanted: Position as Laboratory Technician by young woman, has had two years' Army Hospital Laboratory experience, competent to handle clinical, bacteriological and serological work. Good references. Available June 1st. Address 148, N. M., care of this JOURNAL, Boston Address.

Wanted: Position as bacteriologist by man with five years' experience in bacteriology, water and milk inspections. Two degrees. Two years' teaching experience. Address 149, J. A. M., care of the JOURNAL, Boston address.

PUBLIC HEALTH NOTES

Abstracts by D. Greenberg, M. P. Horwood, James A. Tobey and Homer N. Calver.

Influenza Studies.—In a group of studies of influenza Dr. Raymond Pearl discusses the explosiveness of the outbreaks and other matters. In the first of these studies, published in the fall of 1919, a definite and sensible correlation was established between the explosiveness of the outbreak of influenza in 1918, as measured by an epidemicity index, and the normal death rate from certain organic and chronic diseases. The present, more critical study, attempts to determine by multiple or partial correlations the chief factors for the great variation in explosiveness in 34 American cities. Now indexes are employed and every effort made to get critical quantitative measures of the variables involved.

In general the second study confirms the first; and the author believes that the critical refinements introduced fully meet all earlier criticisms. He maintains that the correlation between the death rate from organic diseases of the heart and explosiveness of the influenza outbreak is extremely significant. He points out that the normal death rate from pulmonary tuberculosis and the explosiveness of the epidemic, though sensibly correlated, is not markedly so; and that the death rates from cancer and typhoid fever show no sensible correlation. Moreover, of the six environmental and demographic variables considered only one, the latitude of the city, shows any correlation with the epidemic; and the significance of this is held to be doubtful.

A similar correlation between deaths from influenza and from cardiac diseases was also found, but not between it and acute nephritis, Bright's disease, or tuberculosis. The author concludes that the results indicate clearly that explosiveness of outbreak and total destructiveness are distinct but related epidemiological characteristics. — Raymond Pearl, *U. S. P. H. Reports*, Feb. 18, 1921.

✚

Pellagra and Income.—That pellagra varies inversely with the family income in the cotton-mill villages of South Carolina is the conclusion drawn after a three-year study by the U. S. Public Health Service. This is the first reported study in which the long-suspected relation of poverty and pellagra is definitely measured. As the income fell the disease was found to increase and to affect more and more other members of the same family. As the income rose, the disease decreased and was rarely found in families that enjoyed the highest incomes, even though this highest was still quite low. Differences among families with the same incomes are attributed by the report to differences in the expenditures for food, intelligence of the housewife, and ownership of cows, gardens, etc. Differences among villages which were economically similar are attributed to differences in the availability and condition of food in local markets. A recent statement by one of the largest life-insurance companies in the United States indicates that the food standards of Southern wage earners must have improved remarkably of late, for the death rate from pellagra has fallen from 6.7 per 100,000 in 1915 to 2.3 in 1919.

✚

Youth and Life.—This is the title of the new exhibit of the U. S. P. H. Service, which consists of 24 attractively illustrated cards, measuring 28x22 inches each. The exhibit, which is especially addressed to young women, is an appeal for physical fitness as the best aid to fulfilling the duties and enjoying the pleasures of life. The value of hygienic living and the need for plenty of exercise, fresh air, sleep, and proper food are emphasized. The function of the glands of the body, including the sex glands, are shown. Human reproduction is approached through a brief presentation of reproduction in plants and animals; and attention is called to the probable effects of sex misconduct (venereal diseases). Womanliness, motherhood, and home-making are extolled. This exhibit may be borrowed for special work from state boards of health or be purchased through the American Social Hygiene Association, New York City.

✚

Fighting Typhus at Its Source.—Typhus, the disease which has recently made its appearance in New York, is being fought today by the American Red Cross in one of its original strongholds, Poland, with five hospital trains consisting of ten cars each.

The hospital trains prove an exceptionally effective weapon against the epidemic which is reaping toll of thousands of lives among the Poles in the districts devastated by the Soviet armies in the summer campaigns.

Many thousands of typhus cases are found in the small villages and isolated farm cottages, far from any hospital, and proper medical attention is an impossibility. The five trains which are operated throughout the isolated districts of Eastern Poland were fitted up as a means of carrying on relief work which was abandoned while the Bolshevist drive was under way.

The trains have specific sections in which they operate and are often away from their base of supplies as long as two months at a time. The work is generally confined to small villages, for here are found the most needy cases. When the train reaches a village, it is side-tracked and a thorough inspection of the section is made and all cases of illness are given immediate treatment.

One car of each train is equipped as an operating room, another for dressings and examinations. The other cars include living quarters for the doctors and nurses and about four cars are loaded with relief supplies.—*(J. A. T.)*

✣

Food Accessory Factors in Relation to the Teeth and Bones.—It has long been believed that dental caries is the result of the fermentation of carbohydrate food by the bacteria in the mouth with the liberation of acids. Recent experiments, however, have tended to contradict this theory and to point to the lack of proper and adequate vitamines in the diet as the cause of caries. Distinct cavities have been produced in the teeth of guinea pigs by controlling the diet. In those cases, the teeth also became loosened, the gums bled, and in some instances there has been a copious flow of pus. The condition was very similar to *Pyorrhea alveolaris*. The bones of the jaw and of the head also showed decalcification. The ribs and the leg bones also showed marked alteration. The guinea pigs were fed on fat free milk and rolled oats. About once every two or three days they would also receive a small piece of carrot and a small leaf of lettuce. When the animals began to show the effects of the inadequate diet, the amount of green foods would be increased. In some cases it was necessary to feed the animals orange juice. Tooth destruction is considered to be one of the first signs of the lack of vitamines in the diet.—Dr. Percy R. Howe, *The Commonhealth*, July-Aug., 1920. *(M. P. H.)*

✣

Progress in Tuberculosis Eradication Work in 1920.—At the end of the last calendar year there were in the United States more than 5,000 accredited herds free from tuberculosis. On June 30, 1920, there were 3,370 such herds and six months later, on December 30, there were 5,013, according to figures just compiled by the Bureau of Animal Industry, United States Department of Agriculture. During the six months' period there has been a marked increase in the number of herds that have successfully passed one test. On June 30, there were 16,599 such herds, and on December 30, 27,482. The department issued a report each month showing by states the number of herds that have been tested, the number of cattle that have reacted, and the number that have been found to be free from the disease.

Minnesota, with 731 accredited herds, leads all other states, with Wisconsin second with 496 herds, and Pennsylvania third with 425. During December, 1,447 herds in which there were 13,979 cattle, were tested in Mississippi. In Wisconsin 851 herds, having in all 15,411 animals were tested.—*(J. A. T.)*

✣

Child Welfare in Roumania.—Nine child welfare stations have been established in Roumania as part of a nation-wide effort to cope with the alarming infant mortality which government records show is the most serious consequence of the war. There are 60,000 deaths annually among children under one year of age. Mortality among children under five years of age averaged about 50%, and in a few districts it is as high as 87%. Tuberculosis, dysentery, pneumonia, affections of the skin and blook diseases are the most seriously threatening diseases.—*(J. A. T.)*

STATE HEALTH NOTES—LEGISLATION

National.—The Sixty-sixth Congress passed into history on March 5, 1921. At the last minute the Langley bill, authorizing an appropriation of $18,600,000 for hospitalization of former service men was passed and signed by President Wilson as one of his final official acts. The bills which were not acted on and which were of interest to public health workers include the Shephard-Towner bill for the protection of infancy and maternity, the Smith-Towner bill to establish a department of education, the Fess-Capper bill for physical education, the France bill for a national department of health, the McCormick bill for a department of public welfare, the bill for government regulation of cold storage and the bill restricting immigration. In order to be given attention, these measures must be reintroduced in the next Congress, the Sixty-seventh. The Shephard-Towner bill has been passed by the Senate and favorably reported in the House. The Smith-Towner bill would have made available $20,000,000 for Federal aid to states for physical education, including health education and sanitation. The immigration bill was important in its possible effect in reducing the danger of the entrance of typhus into this country.

During a discussion of an amendment to the sundry civil appropriation bill concerning additions to the personnel of the U. S. Public Health Service, on February 8, Senator Smoot made an attack on the service. He states his desire for a thorough investigation of the Service and charged that the Surgeon General, while himself a honest and capable man, was surrounded by men with no respect for Congress and who had no mercy on the Treasury. The service was defended by Senator Robinson. On February 9 Senator King charged the U. S. Public Health Service with "a determination to take charge of the health of the people of the United States, to go into the states, and to discharge the duties and responsibilities which belong to the citizens and to local communities." He followed up this interesting statement by saying:

"The thousands of doctors and other employees of the Public Health Service, not content with what might legitimately come within the scope of Federal activity, are seeking to enlarge their powers and their functions and their jurisdiction and their authority, and we find determined efforts made to enter the states and assume a paternal and bureaucratic guardianship over the people. There is a misconception of the power and authority of the general government: it is becoming a veritable Frankenstein; individuals, local communities and the states themselves are being devoured by this huge organism, whose appetite increases as its victories multiply. It is now proposed to have this Public Health Service look after our schools, local and state questions of sanitation, and the health of the individuals. There will be no place left under this oppressive federalism for the individual or the state. We are trying to Russianize this republic, and govern the people by a lot of petty tyrants and office-holders, who sit at Washington and send out their orders and edicts, by a million agents, to all parts of the land. There must be a halt to this grasping determination of the Federal government to take over the functions of the states."

Senator King had his way and an item of $300,000 for investigating diseases of man and conditions influencing their spread was voted down.—(*J. A. T.*)

✣

Public Health in Governor's Messages for 1921.—A bulletin of the Public Affairs Information Service (New York) for February 12, 1921, contains a digest of the messages of governors of 37 states to the legislatures in session. Those which include some reference to public health are as follows:

Arizona—Governor Campbell recommends appointment of full-time health commissioner and adoption of public health program for state.

California—Governor Stephens recommends a comprehensive investigation of the water resources of the state.

Delaware—Govenor Townsend recommends the creation of a council of public welfare to consist of the governor and one member from each of the official administrative bodies in charge of health, educational, charitable, agricultural and child welfare and industrial work of the state.

Idaho—Governor Davis recommends a joint committee to investigate and report a plan of building and organization covering

a period of six years which shall secure improvements demanded in the state institutions for the feeble-minded. He recommends the continuance of the investigation of the state's water resources.

Illinois—Governor Small recommends that full-time health officers be provided for each county in the state and that every city should have local health organizations qualified to cope with disease, such organizations to have under their supervision trained visiting nurses and doctors and nurses for medical inspection in the schools. He comments on the conditions in hospitals for the insane and urges careful and considerate treatment and supervision of inmates and sufficient remuneration of employees as needed improvements. He recommends that the General Assembly study ways and means to provide proper care for the sick. He recommends that more rigid provisions be made for the prevention of venereal diseases and that steps be taken to abolish all places where such diseases have their inception.

Indiana—Governor Goodrich recommends legislation creating the office of county health officer with suitable provision for compensation and compelling every county in the state to appoint such an official. He urges in the event of the existing laws being pronounced invalid, enactment of legislation authorizing desexualization of inmates of various penal, correctional and benevolent institutions.

Massachusetts—Governor Cox recommends that elementary schools set aside fifteen minutes each week for safety education, and that the Commissioner of Education be authorized to prepare facts and methods of presentation for the use of the teachers. He recommends appropriations for further research in the endeavor to check the increase of feeble-minded and to reduce the number sent to correctional institutions.

Michigan—Governor Groesbeck recommends the free distribution of antitoxin and better supervision of health conditions in rural districts.

Nebraska—Governor McKelvie recommends regulation of the sale of butter substitutes; extension of temporary permits to cream station operators to a thirty-day period; continuance of the present law requiring the licensing of dairy herds; reduction in the amount of butter fat required in ice cream; enactment of an egg-candling law. He recommends that the state should encourage any practical raising of the standards of the professions that have to do with the public health, that annual renewal licenses should be required of all professions. He recommends state inspection of boilers and an extension of the safety laws to provide proper protection for workers in excavations, wells, etc.

Nevada—Governor Boyle recommends the appointment of a standing legislative committee which shall attempt to bring about the settlement of the Lake Tahoe storage question and to formulate a definite policy regarding further development of interstate streams heading in California.

New Jersey—Governor Edwards recommends any legislation that may assist in lowering the maternal death rate from child birth. He recommends legislation prohibiting the engaging in industrial occupation or work of any woman for six weeks before and six weeks after the birth of her child. He recommends the passage of laws empowering the State Board of Health to prevent the pollution of any watershed or stream which is a portion of or tributary to, a source of municipal water supply; to prevent the location of factories liable to produce objectionable waste matter on any portion of a watershed without a permit from the Department of Health; to prevent bathing at points where in its judgment such bathing will be in fact a substantial menace to people using the water.

New York—Governor Miller recommends discontinuance of the Department of Narcotic Drug Control and the transfer of its duties to some local authority.

North Dakota—Governor Frazier recommends that physical training in some form be compulsory for every pupil in the schools. He recommends that proper ventilation be required by law in every school, church and other place of public gathering.

Oklahoma—Governor Robertson urges enactment of a stringent dog law.

Pennsylvania—Governor Sproul recommends that laws governing drug traffic be strengthened, penalties increased and provisions rigidly enforced.

South Dakota—Governor McMaster urges revision of mothers' pension law to include

nursing, medical and hospital care for needy expectant mothers. He recommends appropriation to Child Welfare Board for publicity campaign to stimulate provision of suitable recreational facilities for children of the state.

Washington—Governor Hart recommends appropriation for the improvement of dairy herds at state institutions.

West Virignia—Governor Cornwell recommends the establishment of an institution for the care of the feeble-minded.

Wyoming—Governor Carey asks for larger number of dairy inspectors and increased authority to deal with insanitary dairies, stores or places where food is sold. He urges thorough revision of the public health laws and provision of full-time health officers. He urges adequate legislation and sufficient funds to combat venereal diseases. He recommends establishment of a sanatorium or hospital for treatment of tuberculosis.—(*J. A. T.*)

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District of Columbia.—Legislation for the control of venereal diseases in the district of Columbia will be sought from Congress at the forthcoming session by District Health Officer W. C. Fowler, who states that the absence of such a law in the district renders it difficult to accomplish much in the control of venereal diseases. Since practically every state in the Union now has such a law, the local health officials are hopeful that Congress will pass the bill for Washington.

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Maine.—The measure calling for an appropriation of $101,000 for the purposes of the Maine State Department of Health has had its hearings before committees. It was supported by business men, representatives of women's organizations as well as by health associations, and no opposition developed. Viewing the matter from the industrial standpoint, E. M. Hamlin of Milo, Me., a prominent lumber man of the section, said: "Public health, like individual health, is the keystone to progress and success. The State of Maine needs the money asked for to develop public health work and, accordingly, to increase her own efficiency and success."

Massachusetts.—At a meeting of the Commissioner and Public Health Council it was voted to declare *Encephalitis lethargica* a disease dangerous to the public health and as such reportable. This action was instituted in order that further investigation might be made of the incidence, etiology and mode of transmission of this disease. A special pamphlet on the disease will be distributed to the physicians of the state. This condition, up to this time, has been voluntarily reported and about 75 cases have been investigated by the department. Of this group there were but five children, the remaining cases being adults. Of 28 cases cared for in certain of the Boston hospitals an increase in the cell count of spinal fluid has been noted carrying from 15 to 50 mononuclear. In this small group there has not been a single incidence of secondary infection or multiple cases in a household or any localized grouping.

The department is also circularizing the physicians of the state regarding typhus fever, calling to their attention the need of greater vigilance in the differentiation of the exanthematous conditions. While no great apprehension is entertained that typhus fever will be introduced into Massachusetts, the unusual increase of immigration of course makes this possible.

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New Mexico.—House Bills 79, 80 and 85 provide for amendments to existing laws to simplify procedure by the elimination of municipal health officers, concentrating all work in the hands of county health officers; increasing the marriage license fee to provide funds for the payment of sub-registrars for births and deaths, and clarifying the Public Health Law passed at the 1919 session. Senate Bills 47, 97 and 104 provide for the suppression of prostitution, prohibiting quack advertising, and assuring compulsory treatment of prisoners afflicted with venereal disease. House Bill No. 107 provides for the examination of male applicants for marriage. House Bill No. 137 is a red light injunction act. The probability of passing these laws is said to be excellent.

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Oklahoma.—The Women's Legislative Council of Oklahoma, representing six of the largest women's organizations of the state, has gone on record as favoring all

health measures advocated by the State Department of Health.

Among the bills already introduced and awaiting legislative action are: (1) Creation and maintenance of a Bureau of Child Hygiene and Public Health Nursing; (2) amendment to present Birth Registration and Quarantine Laws, attaching penalties for violation; (3) compulsory physical examination for persons engaged in preparation and handling of food; (4) establishment of county health fund to aid county health officers in their work; (5) provide expert medical and surgical attention for wards of state; also placing ten beds in State University Hospital at disposal of State Commissioner of Health; (6) create State Tuberculosis Commission, which shall have supervision over State's Tuberculosis Sanatoria, and (7) care and medical treatment of drug addicts who are indigent.

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South Dakota.—Three bills have been introduced into the 17th session of the Legislative Assembly of the State of South Dakota. Senate Bill No. 32, introduced by the Committee on Public Health, provides for a preliminary examination of all persons who may hereafter desire to practice medicine, surgery, osteopathy or any other form of the healing art within the state; for the creation of a State Board of Preliminary Education, defining its powers and duties; provides compensation for the members thereof, and proscribes penalties for the violation of this act. The State Board of Preliminary Education shall include three members appointed by the Governor, educators of recognized standing from the personnel of state educational institutions, no one of whom shall be a physician, osteopath or engaged in the healing art. Any person who undertakes to practice medicine, surgery, osteopathy or any other form of healing art or who shall treat for compensation by any means whatever any disease of the body or mind, shall first present himself or herself to this Board. All persons shall be required to present evidence of at least four years' high school course, with two years in a college of liberal arts or its equivalent, and shall satisfy such Board that he or she is a person of good moral character, with a diploma from some reputable and recognized school of medicine, surgery or osteopathy, or other school teaching the healing art, which has given a course of at least 32 months' standing over a period of four years, and embracing the study of anatomy, physiology, pathology, gynecology, obstetrics, chemistry, bacteriology, symptomatology, diagnosis, hygiene and sanitation. All applicants of the regular school of medicine shall have a diploma from a medical school the equal of the medical department of the University of South Dakota. Osteopaths and any other form of healers who are graduates of reputable professional schools and have had at least five years' professional experience in South Dakota or other states shall be exempt from the preliminary examination, as also shall be commissioned surgeons of the United States army, navy or marine hospital and United States Public Health Service in actual performance of their duties. Physicians or surgeons from outside the state in consultation with licensed physicians in the state do not require the examination, nor do Christian Scientists as such who do not practice medicine, surgery or obstetrics by the use of any material remedies or agencies.

House Bill No. 68 is for the purpose of regulating the practice of chiropractic, creating a Board of Chiropractic Examiners, and for the provision of examination and licensing of chiropractors. The Board of Examiners is to be selected by the Governor of the state from a list of six chiropractors to be recommended by the South Dakota Chiropractors' Association. The requirement for examination is a high school education or its equivalent, graduation by a chartered chiropractic school giving adequate courses in a great variety of subjects, including hygiene and public health, spinography, nerve tracing, philosophy, principles and practices of chiropractic, and requiring attendance for three semesters before graduation. The Board is to conduct written examinations. Chiropractic is defined by the bill to be "the adjustment by hand of the articulations of the human spine and other incidental adjustments according to the science of chiropractic."

House Bill No. 126 requires applicants

for a marriage license first to obtain from some one of a designated group of authorities a certificate of health and fitness, based upon a physical and mental examination and a history of family traits. The act will prohibit marriage within the state of persons unfit by reason of disease or mental defects, and prescribes the duties of certain county and state officials pertaining to the issue of marriage licenses. If residents of the state with intent to evade the provisions of the act go into another state and have their marriage solemnized with the intention of afterwards returning and residing in the state, and do so return and reside, they shall be guilty of a misdemeanor. The Director of the State Health Laboratory is required to coöperate with the various health officers and physicians in making the examinations of applicants.

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Washington.—Maintenance of a free public school clinic in Seattle has been held to be illegal by a decision of the State Supreme Court, according to the *Seattle Municipal News*. The court ruled that expenditure of school funds for equipping a clinic and employing physicians, dentists and nurses for treating pupils is not authorized by the statutes of the state.

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Wisconsin.—A bill pending in the Wisconsin legislature would bring all public health nurses—school, visiting, industrial, Red Cross, etc.—under the public health nursing law which requires supervision by the State Bureau of Child Welfare and Public Health Nursing and the use of standard forms and reports.

The county nurse law, enacted two years ago by the Wisconsin Legislature, which requires all counties to employ at least one public health nurse by July 1, 1921, and which has been complied with by more than half the counties of the state, is the subject of a bill in the Legislature which seeks to make its application optional with counties. Women of the state who were instrumental in having it passed are aroused by the emasculatory measure and have organized to keep the law intact.

STATE HEALTH NOTES—GENERAL

Alabama.—There is a definite effort in this state to establish a state home for diseased prostitutes, being backed by the State Board of Health, Federation of Women's Clubs, and most of the cities of the state. Sentiment among the public officials is favorable to this method of handling these people, because of the possibility of having enough together to form classes, and having a real rehabilitation program.

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Illinois.—The State Department of Public Health, through its Division of Child Hygiene and Public Health Nursing, has recently called the attention of the medical profession to the epidemic poliomyelitis situation in Illinois. It points out that while little has appeared in the public prints since 1916 concerning this disease, it is nevertheless still present in epidemic form and that control measures are still desirable. In carrying out its plan for the after care of the victims of poliomyelitis through the 23 clinics established in as many cities throughout the state, the Division constantly comes into contact with patients of this crippling disease. It appears that about one case in three is recognized and reported. Physicians who desire information or assistance are invited to communicate with the Department or to bring their patients to any one of the established clinics.

All-day teaching clinics on the diagnosis and treatment of tuberculosis are announced for Murphysboro, Chester and Anna, Illinois. These clinics will be held during March and April with Doctors George Thomas Palmer of Springfield and J. W. Pettit of Ottawa in charge. In each case the program will be carried out under the joint auspices of the local medical societies and tuberculosis associations.

Dr. E. C. White of the Social Hygiene Division of the State Department of Public Health has delivered 31 lectures and shown motion picture films to 26 different local medical societies during the past few months. The films are technical illustrations of modern methods in treating gonorrhea and syphilis and are shown only to the medical profession.

Louisiana.—At the special meeting of the State Board of Health on the 15th, at which Governor John M. Parker presided, a committee was appointed to make report on persons now receiving morphine from the Dispensary. The personnel of the committee is not yet complete, but the resolution asked that there be a member each representing the U. S. Public Health Service, State and Parish Medical Societies, State and City Boards of Health. Dr. B. A. Ledbetter, representing the State Board of Health, and Dr. C. V. Unsworth, representing the State Medical Society, and Dr. J. J. Seeman, representing the City Board of Health, have been appointed.

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Maine.—A Health League has been formed by the women of Colby University, said to be the first of its kind in the country. The Bangor Tuberculosis Association in reporting for the work of the past year notes that it has 53 children in its clinic, most of whom are living in fairly close contact with the disease, but under close supervision. Twenty-five children have been operated upon for tonsils and adenoids. Mary Jane is exciting interest in a good many different sections in the state. She is the demonstration doll and is dressed and undressed, bathed and handled to show the Pine Tree mothers how to handle their own babies. She excites a good deal of comment among the newspapers of the different communities, and the fact that she has a new set of "undies" is made the text of a number of interesting popular stories on infant care and welfare. The M. P. H. A. News, a nine by twelve monthly of eight pages, carries the good word of health procedure to the citizens.

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Michigan.—The State Board of Health has suggested to the citizens the value of the regular spring cleaning. It gets rid of accumulations of dirt and dust which cannot be routed without some such systematic effort. Along the same line of thought the Department of Laboratories is urging the frequent renovation of bedding, noting that now with the continued shifting of population, with more families keeping "roomers" than ever before, the necessity for frequent cleansing process is greater than ever before.

New Jersey.—The Bureau of Child Hygiene of the New Jersey State Department of Health is carrying on active work in every county of the state, aided by part or complete appropriations in nine municipalities. Special efforts are directed to the establishment of community nurses and consultation stations, and supervision of boarding homes and midwives.

Seventy-nine nurses are following the state's plan of Child Hygiene work, making 105,437 visits to approximately 12,000 babies and 2,000 expectant mothers, and at the same time assisting in securing complete birth registration, reporting bad housing, insanitary conditions, and contagious diseases, and supervising the health of children of pre-school age. In a number of communities a program has been worked out, by which the same nurse supervises the child from conception to adolescence, thus eliminating duplication of visits to mothers, babies, pre-school and school children.

The work of the nurse in the home is supplemented by consultation or Baby Keep Well Stations, which have enlisted the cooperation of local physicians, and stimulate continuous interest of mothers by prizes for regular attendance and adherence to Child Hygiene rules, especially breast-feeding.

By an addition to the State Sanitary Code, the State Board of Health has been granted the power to license boarding homes for children. Investigations and surveys have been made, which have resulted in the closing of undesirable homes and maintenance of a certain standard for license.

Special emphasis has been given to the protection of the infant of the unmarried mother. An effort has been made to place the mother under supervision of a social agency or nurse in the community, for the care of the child's health and the mother's problems.

Supervision of midwives has been carried on in every county by special supervisors, who instruct them in the principles of Child Hygiene, obstetrics, sanitation and cleanliness, and visit them once a month. Efforts have been made to eliminate the unfit, dangerous and unlicensed midwife, and midwife associations have been formed which stimulate higher standards.

Nova Scotia.—Dr. F. W. Tidmarsh, after having taken a special course in conducting nutrition clinics in Boston, has been appointed to the same staff of the Massachusetts-Halifax Commission for the purpose of organizing nutrition clinics in the Commission's Health Centres in Halifax and Dartmouth. These nutrition clinics will be organized for undernourished pre-school age children and school age groups.

Dr. W. Alan Curry has accepted an appointment to organize Posture clinics for the Commission. To this service children will be admitted, after such handicaps as adenoids and tonsils have been removed, and the teeth rectified.

These services will be watched with the greatest of interest by the medical and nursing profession and by all public health workers.

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North Carolina.—North Carolina now leads the entire United States with the highest birth rate in the Union according to statistics for 1920 just compiled by the State Board of Health. At the same time this state has one of the lowest death rates. Reports during the past year show a total of 83,966 births in the state, a rate of 32.8 per thousand. The deaths totaled for the same period 33,228, a rate of 12.9 per thousand. These figures do not include the stillbirths, which amounted to 4,171 for the year.

North Carolina has been exceeded in birth rate heretofore only by Utah, which in 1918 had a rate of 31.9. The rate for the entire registration area of the country the same year was 24.4. For the same year the death rate for the same area was 18.2.

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Ohio.—To sell public health to the citizens of Cincinnati is the aim of a big health demonstration planned by Cincinnati's health agencies for the middle of October in Music Hall. The Exposition will be given under the auspices of the Public Health Federation and with the coöperation of the Board of Education, the American Red Cross, the United States Public Health Service, the Chamber of Commerce and of practically every other important health, safety and recreational organization in the city. The safety features of the Exhibit are expected to be in charge of the newly organized Committee on Safety of the Chamber of Commerce. The Board of Health has not yet officially acted on the matter but it is practically certain that it will actively participate.

The Exposition will consist, it is planned, of exhibits of the Board of Health and the great majority of Cincinnati's health, recreational and safety organizations and its hospitals. There will be demonstrations on many phases of the work of all these agencies and in addition pageants, playlets and motion pictures in abundance. At least ten health organizations operating on a national scope will participate as will also several other departments of the Federal Government.

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Oklahoma.—A two-day public health nurses' institute attended by about forty public health nurses from all parts of the state was held in Oklahoma City February 18 and 19, under the direction of the Oklahoma Public Health Association. These gatherings are held three or four times each year for public health nurses employed by all organizations, and have been found eminently successful, not only in imparting much useful knowledge and information, but more especially by giving the nurses a broader outlook on the field of public health, encouraging those who are laboring under difficulties in pioneer communities and giving the nurses an opportunity to meet each other and learn about the work going on outside their respective communities.

The institute consisted of lectures, round table discussions and demonstrations. Following is an outline of the program: "Development of Public Health Work in Oklahoma," Jules Schevitz, general secretary Oklahoma Public Health Association; "Coördination of Public Health Nursing in Oklahoma City," Miss Margaret Howard, superintendent Oklahoma City Public Health Nursing Association; "Health Program Before the Eighth Legislature," Dr. A. R. Lewis, State Health Commissioner; "Consultant Tuberculosis Service," Dr. L. J. Moorman, president Oklahoma City Anti-Tuberculosis Society, and "Health Crusade Tournament," Miss Henriette Hart, crusader executive, Oklahoma Public Health Association.

A school nursing demonstration was held under the direction of Miss Anna Stanley, school nursing supervisor of the Southwestern Division American Red Cross, and the nurses' round table was led by Miss Rosalind Mackay, state director of public health nurses. The meeting was featured by an inspection of the open air school and by an exhibition of health films, also a plea for recruiting of student nurses by Miss Ethel G. Pinder, director of division of nursing, Southwestern Division American Red Cross. Mrs. Bessie McColgin, only woman member of the House of Representatives, delivered an excellent address on women's and children's legislation.

The Rotary Club of Shawnee, Okla., has offered a prize of $2,500 to be awarded to the city (20,000 or under in population) that is voted "the model city in the state for rearing the young." Many municipalities have already entered the "better cities" contest, there being but three ineligible because of too great population. Decision will be made Thanksgiving, 1921.

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Texas.—Here are some clean-up hints that are promulgated by Health Commissioner Carrick for guidance in the coming clean-up week in Texas:

See that all rubbish is removed from back yard and surroundings.

Clean all windows and keep them open to fresh air and sunlight.

Don't forget what plenty of soap, hot water and sunshine will do.

Dry sweeping and dusting are dangerous practices.

Dispose of waste paper and other household rubbish regularly.

Do not forget the attic and remote places.

Do not tolerate dirty, broken walls and ceilings.

See that leaky roofs and defective plumbing are repaired.

Outside toilets should be screened from flies and vermin.

Vaults must be cleaned.

Top covering of shallow wells should be watertight.

Drain moisture from garbage before placing in can.

Provide a proper garbage can and keep the can covered.

Burn or bury garbage where no garbage collection exists.

Don't let milk bottles stand unwashed after use.

Keep loose manure in fly-tight boxes and remove at regular intervals.

Fight the flies by eliminating their breeding places.

No filth, no flies.

Inspect your roof gutter, cistern and fountains for mosquito breeding.

Drain, oil and screen against malaria carriers.

Cease keeping company with the rat; build him out of your home by placing metal laths between double walls.

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Utah.—The courses in hygiene that are given in the public schools under the Department of Public Instruction, Division of Health Education, take up this month the laws of health, including cleanliness of person, clothes and the mind; the law of kindness, which exercises its effect upon the mind; good postures, in which correct positions both in sitting and standing are set forth with the admonition to stop when in the wrong posture and take the right one; and the bath. In the latter little lessons are outlined, including the facts that the bath is necessary to the individual for his own sake and for the sake of others. The essentials of a proper bath are stated for the benefit of the scholars.

The same department is undertaking the information of the public with reference to cancer. The facts are emphasized, that if detected early, cancer may be conquered by proper treatment, and further, that it is possible by avoiding certain things to prevent this disease by removing conditions that are known to precede it. Statistics of cancer and some simple bits of advice are given, with the request of the readers of the "Health Letter" to spread the information.

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Vancouver.—In the far Northwest health matters are occupying a fair share of the space in the newspapers. A single issue of the *Vancouver Sun* discusses the question of hospitals and business, outlines progress of the Child Welfare Association, describes improved sewer construction in the district, and discusses the betterment of playgrounds

in connection with schools. With reference to hospitals and business, the *Sun* says editorially that the time has passed when the outlays of modern hospitals can be met with casual financing. There must be a complete reorganization, and business principles should be supreme in the management. The editorial takes up the vexed question of immigrant influence, and says boldly that the city cannot afford to lose money on cases originating outside of Vancouver. These must pay their own way, or the government must pay for them. "The hospitals themselves have fallen ill," says the editor. "The remedy is business. Selling at or below costs means bankruptcy. Hospitals as they are at the present time manage to secure only the unprofitable parts of the business. Inefficiency and bankruptcy are the certain results."

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Virginia.—Practically every county in the state was represented at the recent Health Officers' Conference and valuable work was done in outlining programs for the coming year.

After experimental work for two years the program for the treatment of crippled children is now a fixture in the work of the State Board of Health. The effort began two years ago with the voluntary service of a single physician. Last year Governor Davis included in his budget the sum of $10,000 annually for the work, and it is expected that the next legislature will increase this amount.

The testing out of the new law which makes the physical examination of school children compulsory seems to be satisfactory in Virginia. Dr. E. G. Williams, State Health Commissioner, emphasizes the absurdity of trying to provide proper courses for a child until his capacities, both physical and mental, have been determined. It is unjust to force the physically imperfect child to compete with healthy and strong neighbors. The examination has already resulted in the establishment of various clinics, dental and oral among them, which it is hoped may become permanent. Another development has been the demand for school nurses and the authorities have not thus far been able to secure trained nurses in sufficient number for the actual needs.

Wisconsin.—The next annual meeting of the National Conference of Social Work will be held in the city of Milwaukee from June 22 to 29, 1921. A program of especial value and interest to all those concerned in the subject of health will be presented at this meeting. The program for Division III, on Health, provides for five division meetings, at which the following subjects will be presented:

"Coöperation and Coördination in Health Work."

a. The National Council of Public Health—Organization and program.

b. National Council for Coördinating Child Health Activities.

c. How can voluntary organizations best coöperate with health officials?

"The Health Program of the American Red Cross."

a. The social significance of health centers.

b. Coöperative health plan of the New York County Chapter.

c. Public health nursing program and activities of the A. R. C.

"Social Significance of Child Health Work."

a. Education in health habits.

b. What state bureaus of child hygiene are doing to promote child health.

"Government Agencies in Their Relation to Health."

a. The United States Public Health Service.

b. The Children's Bureau.

c. Department of Agriculture, Extension service in home economics.

d. Bureau of Education.

"Certain Elements in a Health Program for Children" (joint session with Division I—Children).

a. The Undernourished Child—The significance of bringing him up to standard.

b. Where should this nutrition service next be centered: in the school room, in the child's own family, in the home?

c. How much more may be expected from medical service in the public schools?

Among those who will speak at these meetings will be: Mr. Sherman C. Kingsley, Dr. E. V. McCollum, Mr. Courtenay Dinwiddie, Dr. C. A. Pierce, Dr. Anna E. Rude, Dr. C. F. Langworthy, Mr. Willard S. Small, Mr. Philip Platt, Dr. Donald B. Armstrong and Mr. J. Mace Andress.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst and E. B. Starr.

Great Importance of Physical Efficiency in Certain Avocations.—When the United States entered the World War our British confreres gave us all the information they had on the medical problems of flying. They had learned much by hard experience in the early days of the war, and estimated that their air casualties during the first year of the war were as follows: Due to Germans, 2%; due to defective planes, 8%; due to physical defects of pilots, 90%. They then established their Air Medical Service and specialized on the care of the flier. The next year the 90% was reduced to 20%, and the following year to 12%.

In America difficulty was had in convincing some of the flying commanders, even, of the utility of using oxygen at high altitudes. Two flying commanders averred that they were just as fit at 20,000 feet as on the ground, and scoffed at the idea of using oxygen. A week later, however, these same officers, both having used oxygen for a long flight of more than three hours at an altitude of over 18,000 feet, were loud in their praise of the benefits it conferred, and made its use compulsory among their pilots and observers.—Abstracted by *Medico-Military Review*, U. S. A., Vol. 4, No. 3, Feb. 1, 1921, from *Air Service News Letters* (U. S.).

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Industrial Fatigue.—If we define fatigue by its effects, since there is no satisfactory definition or test, we confuse it with mere boredom, and we neglect the fact that in certain conditions fatigue may temporarily be accompanied by increased output, just as may occur in the early stages of alcoholic intoxication. For these reasons output is not a satisfactory criterion, yet at present no better is available. None of the usual laboratory tests are really adequate for industrial application. Five different factors influence the output curves: (1) Fatigue, (2) Practice, (3) Incitement (or "warming up"), (4) Settlement ("Monday morning effect," or "not yet in the swing of work," which occurs among those who have spent the week-end restfully as well as in those who have spent it in dissipation), and (5) "Spurt" (divided into "initial" and "end" spurts, the first the result of freshness, the second the influence of the approaching end of the given job). Analysis of typical industrial curves of output in the light of these five factors, shows there is no evidence of undue fatigue, for example, in a man employed 8 hours a day in engineering work. In a similar work curve of 10 hours, we appear to see far clearer signs of fatigue; at all events, the efficiency of the 8-hour day is distinctly greater than the 10-hour day curve. In some processes a 10-minute rest in each 4-hour spell was found to increase the output by 26%. A certain amount of fatigue is inevitable and is not harmful if it can be dissipated by rest. Physiological fluctuations in efficiency occur quite apart from fatigue. A uniform output hour by hour, is neither natural nor desirable. To expect such goes contrawise to fundamental physiological and psychological principles. Some work best in short explosive bursts, others in longer, steadier spells. Great importance is to be attached to the rhythmicity of movement. The worker tends to demand interest and is not willing to become an automaton.—C. S. Myers, *Lancet*, Jan. 22, 1921, p. 205.

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Occupational Hazards and Diagnostic Signs.—Copies of a pamphlet bearing this title may be obtained by writing to the Statistical Bureau, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. There is an alphabetical list of hazardous occupations arranged in column form, and for each hazard another column gives the symptoms, condition or disease which are looked for, and a third column the industries and trade processes which offer such exposures. An invitation is extended to industrial physicians and surgeons to note additional hazards and hazardous occupations and further symptoms which are not included in the pamphlet for any of the hazards named. A blank for such purpose comes with the pamphlet; also a stamped, addressed envelope.

Industrial Lighting.—A chief factor in industrial lighting is insufficient light. In the coal industry, for example, we think of coal mine accidents as resulting mostly from falling slate or gas explosions, whereas statistics show that out of each one thousand men employed underground, there are eleven serious or fatal accidents a year, and out of the same number of employees working above the ground there are five serious accidents per year. The excess of six accidents can be very largely charged to a greater insufficiency of light below ground. Out of the 25,000 serious industrial accidents in the United States per year at least 15 per cent are chargeable to poor illumination. One does not often think about the fact that the intensities of artificial light in industrial plants are much below the daylight intensities. Daylight in factories runs from 4 to 50 foot-candles; artificial lighting from 4 to 12 and sometimes down to ¼ foot-candles. Stairways and places where accidents are the most prevalent are usually the most poorly lighted places. In general there are two accidents under artificial lighting compared to one accident under daylight conditions; 79 percent of manufacturers interviewed give lighting as a reason for increased production; 71 percent say good lighting decreases spoilage; 59 percent say that good lighting is followed by fewer accidents. "The total cost of accidents, the total disability payments, and the total lost time of industrial operators in the United States amount to more than the total cost of artificial illumination." In regard to keeping lighting fixtures cleaned there is a slogan as follows: "Water is cheaper than Watts." In a very dirty building, after three weeks of neglect, the illumination may drop from 4.0 to 2.0 foot-candles. The cost of good lighting is perhaps one-tenth of 1 per cent expressed in the evaluation of the working man and his possible output. Two minutes per day added to the workman's output will equal his share of the cost of lighting for the entire day.—Samuel G. Hibben, *Bulletin New York State Industrial Commission*, Albany, December, 1920, Pages, 50-51.

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Industrial Lighting in Relation to Health and Safety.—The writer gives a brief history of the development of industrial lighting before the Congress (In Industrial Hygiene) in Brussels covering the work in Belgium, France, Great Britain and the United States. The British Interim Report in 1915 indicated that "adequate lighting should fulfill the following requirements:—

(a) Sufficient illumination on the work.

(b) A reasonable degree of constancy and uniformity over the necessary area of work.

(c) The placing or shading of lamps so that the light from them does not fall directly in the eyes of an operator when engaged on his work or when looking horizontally across the room.

(d) The placing of lights so as to avoid the casting of inconvenient extraneous shadows on the work."

"The results of inadequate illumination are damage to eyesight and personal health, various forms of domestic insanitation, accidents in factories and workshops, often accompanied by diminution in output of work and lack of discipline. Bad lighting affects output unfavorably, not only by making good and rapid work more difficult, but by causing headaches and other effects of eyestrain." There are now in the United States six states which possess codes in industrial lighting. Experience in New York State shows that of 3,185 orders issued for improvements in lighting during the period August, 1918, to February, 1919, 1,566 compliances had already been carried out—a favorable result for the first seven months' operation of this new measure. The British Home Office found that almost invariably the accident rate was higher by night, the average increase being 29% for all forms of accidents and 71% in the case of persons falling—a form of accident for which inadequate lighting is very apt to be responsible. In the case of docks, where this type of accident is very common, the increase was as much as 102%. The Commonwealth Edison Company of Chicago recently made a survey of lighting conditions in 93 factories. First the factories ran with the existing illumination and then with higher values. In one case the improved illumination resulted in an increased output varying from 8 to 27 percent in different departments, and, on the average, it was concluded than an increased cost of lighting amounting to not more than 5 percent of the pay-roll would lead to an increased production of quite 15 per cent. Seeing that the cost of lighting in general forms less than 1 percent of the amount paid in wages it can readily be seen how easily the cost of improved lighting may be more than compensated by improved production. The author, in summing

up, emphasizes the desirability of *international agreement on regulations on factory lighting in various countries,* and of coöperation for the carrying on of further researches in all relations, especially between lighting and health, safety and efficiency.

The general consensus of opinion strongly favors the view that inadequate lighting is one of the chief causes of miners' nystagmus and that in addition to the Illuminating Engineering

Society, the Council of British Ophthalmologists and the Royal Society of Medicine should coöperate.—Leon Gaster, *Jour. of State Medicine,* Vol. XXVIII, No. 9, Sept., 1920, pp. 274-282.

✣

Fatigue and Efficiency in the Iron and Steel Industry.—This report is based on investigations of numerous iron and steel works situated in England, Scotland and Wales, where all the workers are now on 8-hour shifts, though in certain districts they were on 12-hour shifts until recently. It shows that as a result of the reduction of hours, the output from the open hearth steel furnaces went up 2 to 9%, but that there was no change in the output from the rolling mills or the blast furnaces. The timekeeping of the blast-furnace men, however, improved, and it was found possible to reduce the number of men required to run the furnaces.

The effects of fatigue were specially seen in the blast-furnace men on Sundays, when they worked a 16-hour shift, for their rate of charging the furnaces (by hand) was 5 to 10% less than on weekdays when they worked 8-hour shifts. Again, the rate of charging was 15% less in the summer than in the winter, and seasonal variations in the output of the heavy workers were likewise observed at the steel furnaces, the puddling furnaces and the rolling mills. Suggestions are made for reducing the heaviest work of all, namely, that of the steel melters when fettling (i. e., mending) their furnaces.

Sickness and mortality data relating to 24,000 iron and steel workers were tabulated for a six-year period. Men on the heaviest work experienced the most sickness, the steel melters showing 23% more than the average, the puddlers 20% more, the tinplate mill men 12% more, and the rolling mill men 8% more. The excess of sickness shown by the puddlers was due entirely to rheumatism and respiratory diseases. The steel melters showed 26% greater mortality than the average, and the blast-furnace men a higher mortality still. —Abstracted by *Monthly Circular,* from Industrial Fatigue Research Report No. 5, *Ministry of Health,* Great Britain.

✣

Creation of Service of Industrial Hygiene at International Labor Office.—A Service of Industrial Hygiene has recently been created as part of the International Labor Organization, to study the questions which the Commission on Unhealthy Processes of the first International Labor Conference at Washington in 1919 brought to the special attention of the International Labor Office. These questions include protection against infection by anthrax in industry; prohibition of the use of white lead in painting; prohibition of the use of nitrate of mercury in the process of "carrotting" rabbit fur; and the prevention of poisoning by carbon monoxide gas and by lead. The first two questions, relating to anthrax and white lead, have been placed on the agenda for the 1921 conventions to be held at Geneva in April, and the Service of Industrial Hygiene is not engaged in collecting information on the two points.

Aside from the definite tasks assigned to it, the Service of Industrial Hygiene will study the general problems of the health of the worker, industrial fatigue, and feeding. Its program of action is thus summarized in the International Labor Office Bulletin: (1) The conduct of a general and permanent inquiry into unhealthy processes with a view to the preparation of draft conventions and recommendations for submission to General Conference, and (2) generally to deal with everything relating to industrial hygiene by the coördination of the provisions common to the various national legislations and the preparation of international regulations.

Dr. Lugi Carozzi, formerly head of a service at the Milan clinic, lecturer on industrial pathology at the Rome University and medical inspector of labor at the Ministry of Industry and Commerce, is Director of the new service.—*Monthly Review* of U. S. Bureau Labor Statistics, December, 1920.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by Arthur Lederer, M. D.

Hemolytic Streptococcus Carriers.—The incidence of carriers at any army post during peace times was not greater than that in civil life. New recruits spending a short period of time at this army post did not show an increase in the carrier ratio. Pathologic conditions of the pharynx, such as hypertrophied tonsils, tend to prolong the state of a hemolytic streptococcus carrier. The classification of streptococci, according to their reactions on the sugars, is believed to be of great importance from the standpoint of epidemiology, and should be done in every case in which a more thorough knowledge of the streptococci isolated from patients, carriers of the environment if desired. It is believed that streptococcus infections cannot be explained on the basis of contact alone. Streptococci were found to be distributed generally in the air of a ward containing patients with positive throat cultures. The presence of these organisms in the air probably explains the ease with which streptococcus infections take place. Their number is also probably influenced by the amount of dust in the room. This reëmphasizes the necessity of measures of allaying dust and of keeping patients with negative throat cultures in separate wards. —J. W. Walker, *Jour. Inf. Dis.*, 27, 618 (1920).

✝

Wassermann Test in Patients Affected with Malaria in the Tropics.—In a heavily infected malarial country a positive Wassermann reaction cannot be considered as due to syphilis if there is no special evidence in favor of syphilis. If after a good quinine treatment a positive Wassermann reaction becomes negative or distinctly weaker, without antisyphilitic treatment, probably the positive Wassermann was a sequel of malaria. Especially in natives a positive Wassermann reaction does not permit of conclusions without careful consideration; a positive result with unheated serum is in such cases almost useless, a negative result of course will be as valuable as elsewhere. In natives, a Wassermann test conducted with heated serum within three months from an attack of malaria is of little value for the diagnosis of syphilis. To consider a test made not more than a week after the attack as advised by Sutherland and Mitra is certainly wrong.—F. H. Hehewerth and W. A. Kop, *Jour. Hyg. (London)*, 19, 277 (1921).

✝

The Colloidal Gold Reaction in the Cerebrospinal Fluid.—The colloidal gold reaction originated by Lange in 1912 appears to indicate the amount of globulin in the cerebro-spinal fluid, and indirectly the amount of albumin. Although the reaction has some clinical value, it must not be forgotten that it is always accompanied by a cerebro-spinal pleocytosis and an increase of globulin. Its advantage consists in its being the last reaction to persist after intravenous or intrathecal treatment, and also in its appearing earlier than the Wassermann reaction. The colloidal gold reaction, however, is not superior, either from a diagnostic or prognostic point of view, to cytodiagnosis and the albumin reaction described by Ravaut.—Ponselle, *Ann. de Derm. et de Syph.*, No. 8, 1920; *Brit. Med. Jour.*, No. 3129, (1920).

✝

Practical Methods in the Purification of Obligate Anaërobes.—The author calls attention to the relatively recent appreciation of the failure of some early investigators to secure unquestionably pure cultures of obligative anaërobes. The methods of initial culture and selective enrichment are discussed and certain observations are noted on the elimination of aërobic contaminants through selective heating and selective cultivation. Certain limitations on cultural methods of isolation, especially surface methods, are suggested, and a critical review of the present status of surface culture methods, deep culture methods and microscopic methods of isolation, is given. It is concluded that the method of isolation by deep cultivation in glucose agar is most practical.—Ivan C. Hall, *Jour. Inf. Dis.*, 27, 576 (1920).

Leukemia: Type Diagnosis by Oxydase Method of Blood-Staining.—The oxydase method is best suited for the differentiation between the large lymphocytes and myelocytes. The solutions required are:

Solution A.

95% alcohol ..... 9 parts
Formaldehyde Sol. (40% gas).. 1 part

Solution B.

Alpha-naphthol
(Merck's reagent) ..... 1 gram
40% alcohol ..... 100 cc.
Hydrogen peroxide ..... 0.2 cc.
(Must be fresh)

Solution C.

Pyronin ..... 1 gram
Anilin ..... 4 cc.
40% alcohol ..... 96 cc.

Solution D.

0.5% solution of methylene blue
(Gruebler's BX)

The films should be fixed by covering with solution A. After two minutes this is washed off with water and the film flooded with solution B. This is washed off and the film is allowed to remain in a dish of running water for 15 minutes. It is then dried and stained for two minutes with solution C. This is washed off with water and solution D is poured on and allowed to remain for 30 to 60 seconds. After washing with water the slide is blotted and mounted in neutral balsam. All myeloid cells, polynuclear myelocytes, transitional and myeloblasts, will show blue granules, while lymphocytes and lymphoblasts will not. Solution B deteriorates very rapidly and must be made up fresh.—George L. Lambright, *Am. Jour. Med. Sciences*, Vol. 161, 209 (1921).

✚

Simple Method for the Removal of Natural Amboceptor from Human Sera.—This method for the removal of natural amboceptor from the patient's sera has been applied to 10,000 Wassermann tests and in the author's opinion meets the requirements of laboratories performing large numbers of tests daily. The method is based on the well-known affinity of sheep-cells for anti-sheep amboceptor, and consists of adding packed sheep-cells to inactivated serum in the proportion of one drop per cc. of serum, and permitting the extraction to take place for 10 minutes at room temperature. In applying this simple procedure, the following factors are to be considered. The packed sheep-cells employed are part of the same cells which, after proper dilution, are used in making the sheep-cell suspension for the Wassermann tests. A quantity of sheep-cells are washed daily with a view of having several extra cc. of packed cells for the absorption of amboceptor. The drop employed is somewhat smaller than ordinary size, comprising 25 to 30 drops per cc.—R. L. Kahn, *Jour. Lab. Clin. Med.*, 6, 218, (1921).

✚

Gonococcus Types.—The results of absorption experiments without question prove that the gonococci are a collection of organisms that falls into distinct clear-cut immunologic types, having very little relation with one another. The agglutinins of a serum produced by one type cannot be absorbed by any of the strains forming the other types no matter how highly the serum is diluted and how much of the growth used. Thus strain 1 serum was diluted 1-250 and 1 cc. absorbed by the growth of two large slants of selected heterologous strains. None of them were able to absorb any of the agglutinins. Yet the homologous strains absorbed them completely in one-half and one-third of that amount. The 85 strains included in this investigation fell into six very distinct serologic types. By far the largest number of the strains belonged to either type 1 or 2. The Torrey strains from three laboratories established themselves as members of type 1, while of the ten strains received from another laboratory only 4 fell into this type. The remaining 6 formed the C race of type 2.—John Hermanies, *Jour. Inf. Dis.*, 28, 133, (1921).

✚

Experimental Transmission of Yellow Fever.—Yellow fever has been transmitted experimentally to the guinea-pig by injecting intraperitoneally the blood of patients taken during the third or fourth day of illness. Pure cultures of *Leptospira icteroides* have been obtained with the blood either from yellow fever patients or experimentally infected guinea-pigs, by using the culture medium and technic described by Noguchi. The organism isolated in Vera Cruz has the same characteristics as that isolated by Noguchi in Guayaquil.—P. Perez Grovas, *Jour. A. M. A.*, 76, 362,(1921).

Official Control of the Wassermann Test in Germany.—The "Verstaatlichung" of the Wassermann reaction went into effect Jan. 1, 1921. According to the new regulation, physicians who specialize in examination of blood by the Wassermann technic will have to obtain a special permit to do so. They will be required to do the work under certain special conditions and use for the test only extracts which have been officially standardized. The official standardization is done at the Institute für experimentelle Therapie at Frankfurt a. M., of which Prof. W. Kolle is in charge. These restrictions apply only to physicians who do a laboratory business with specimens sent in from outside. They do not apply to the test in private practice or in public institutions.—Anon., *Jour. A. M. A.*, 76, 255, (1921).

✚

New Serum Reaction in Syphilis.—The test as evolved consists merely in placing with a pipette 1 cc. of clear serum at the bottom of a test tube, adding two drops of commercial formalin, shaking to obtain a good mixture, and leaving the tubes stoppered with cotton-wool at the room temperature for 24 to 30 hours. The reading of the reaction is easy; if positive the mixture becomes more or less solid, clear, and jelly-like; in negative reactions it remains perfectly fluid. In this way the authors have tested over 400 serums, and compared the results with those obtained in the Wassermann reaction. Mixtures of positive Wassermann serums always give positive formalin reactions, and mixtures of negative Wassermann serums always give negative formalin reactions. In separate cases the results of the Wassermann reaction and this formol-gel reaction accord in 85% of instances. The authors state that where the two reactions disagreed they were unable to discover which was the more accurate, as the true diagnosis in these cases was unknown. However, in certain cases, such as early syphilis, clinically certain, where the Wassermann reaction failed, the formol-gel reaction gave positive results. Preliminary inactivation of the serum is unnecessary, nor does it modify the reaction in any way to incubate the mixtures.—Gaté and Papacostas, *C. R. Soc. Biologie*, November 20, 1920; *Brit. Med. Jour.*, No. 3133, (1921).

Presence of Spirochætes in Lymphatic Glands.—The author carried out 89 punctures of the lymph glands in 83 syphilitic patients to determine the presence of the *Spirochæta pallida*, with the following results: Of 24 patients in the primary stage, 20 showed spirochætes in the regional lymphatic glands. Of 18 patients at the beginning of the secondary stage, only 7 showed spirochætes in the puncture fluid. Of 27 cases in the late secondary stage, 20 were negative; 4 cases in the tertiary stage were also negative. Of 14 cases in the latent stage, 3 were positive and 11 negative. It is thus obvious that in the early stage of syphilis the *Spirochæta pallida* is very frequently present in the regional lymph glands, and even in the late secondary stage it is often found, though with diminished frequency. The duration of the disease in such late secondary cases was from four months to two years. In the latent stage spirochætes were found as late as the third year of the disease.—Fruehwald, *Wien. klin. Woch.*, November 11, 1920; *Brit. Med. Jour.*, No. 3133, (1921).

✚

Modification of Stain for Diphtheria Bacilli.—The formulas of the solutions as modified are:

Solution 1

Toluidin blue	0.15 gm.
Methyl green	0.20 gm.
Acetic acid (glacial)	1.00 cc.
Alcohol (95%)	2.00 cc.
Water (distilled)	100.00 cc.

After standing for one day, the solution is filtered and is ready for use.

Solution 2

Iodin	2 gm.
Potassium iodid	3 gm.
Water (distilled)	300 cc.

The solution is ready for use as soon as the iodin is entirely dissolved. Smears are made on slides or cover glasses and fixed by heat in the usual manner; stained with solution 1 for one minute; washed with water; dried with good absorbent filter paper; stained with solution 2 for one minute; washed, and dried with filter paper. The granules of diphtheria bacilli are stained black; the bars, dark green, and the intermediate portions, a light green. The contrast is marked. The stain has been very serviceable in detecting diphtheria bacilli.—Henry Albert, *Jour. A. M. A.*, 76, 240 (1921).

Simple Device for Measuring Rate of Metabolism.—An apparatus for measuring the rate of oxygen consumption, designed to be portable in a practical sense, is described and illustrated. Sources of error are discussed and their percentages reduced to a minimum consistent with simplicity. Mathematical procedures necessary for calculation of the rate of metabolism (from the respiratory quotient, the body area, and the rate of oxygen consumption) are eliminated from the test. The reading is made directly, in terms of calories per hour per square meter of body area. Independent and comparative tests show its technical variations to be within physiologic and individual variations, and, therefore, adequate to the needs of the clinician as an instrument for measuring basal metabolism.—Harry M. Jones, *Arch. Int. Med.*, 27, 48 (1921).

✣

Relation Between the Virulence of Streptococci and Hemolysin.—Strains of streptococci whose virulence has been increased for any one species of animal do not produce greater concentrations of hemolysin than the original strain. Furthermore, there is a tendency for the original culture to grow more rapidly than the more pathogenic form, and to reach the height of hemolysin production at an earlier stage during the growth of the culture. These conclusions can probably be applied only to experiments in which the serum used in the media is from some species not employed for the animal passages.—Franklin A. Stevens, John W. S. Brady and Randolph West, *Jour. Exp. Med.*, 33, 223 (1921).

✣

Hemotoxin Production by the Streptococcus in Relation to Its Metabolism.—The question of hemotoxin production remains a complicated one. A summary of the entire study indicates only that hemotoxin production is due to, and controlled by, conditions that influence growth. As such conditions can be studied only as a complex of interacting forces with no possibility of observing the action of a single variant, it is not possible to state the exact relationship between any one phase of metabolism and hemotoxin production. One can conclude only that hemotoxin production is an expression of the summation of activities of the organism and is capable of varying with every variation of environment and nutrition.—Marjorie W. Cook, Virginia Mix and Ethel O. Culvyhouse, *Jour. Inf. Dis.*, 28, 93, (1921).

✣

Study of the Thrush Parasite.—Seventeen strains of the thrush parasite proved identical and constant in their morphologic and cultural characters. They all corresponded to the nonliquifying type of Fischer and Brebeck. Carbohydrate mediums were fermented uniformly and constantly by all strains. They are of value in the identification of the species. Agglutinins are not produced by the thrush parasite in sufficient quantity to be of diagnostic or differential value. The thrush parasite produces chlamydospores but not ascospores. It is correctly placed in the genus *Oidium*. The organism tends to assume a mycelial form in liquid mediums, in mediums containing complex carbohydrate, in mediums of low oxygen tension, and in mediums of low surface tension, while the unicellular or yeast-like form occurs in solid mediums, in the presence of simple carbohydrates, and an abundance of oxygen, or mediums of higher surface tension. These factors may be interrelated, while other factors as yet unknown may affect the morphology. It is suggested the pleomorphism of this organism is an attempt at adaptation, the mycelial form developing in relatively unfavorable conditions.—Bertha C. Fineman, *Jour. Inf. Dis.*, 28, 185, (1921).

✣

Precipitin Reaction in Diagnosis of Gonococcus Infections.—The authors claim that the present methods of diagnosing gonorrhea are inadequate since in many cases, clinically positive gonococci cannot be demonstrated in the discharge whereas a positive precipitin test is obtained in all cases where the gonococcus can be found in the discharge. A positive precipitin test is found in specimens from many patients whose history and clinical symptoms point to gonorrhea but in whose discharges the gonococcus cannot be demonstrated. The precipitin test is of value in the diagnosis of vaginal and other specimens where the microscopic demonstration of gonococci in the discharge is difficult or impossible.—G. H. Robinson and P. D. Meader, *Jour. Urol.*, 4, 551, (1920).

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Etiology of Typhus Fever.—From a careful review of the literature the author's opinion is that there is no conclusive evidence that the *Bacillus typhi-exanthematici* of Plotz is the cause of typhus fever. He believes that the organism *Proteus X 19* of Felix and Weil has more in favor of being the cause of typhus fever than the Plotz bacillus, but on immunologic and other grounds it appears that both of these bacteria are secondary invaders. There is evidently a state of more or less mixed infection in typhus fever. There may be a state of symbiosis.

The organism studied by Ricketts and later confirmed by Prowazek occupies a position closer to protozoa than to bacteria. The author regards this group the *Rickettsia prowazeki* as the probable cause of typhus fever.—E. W. Scultz, *Amer. Jour. Med. Sciences,* Jan., 1921, 78 (D. G.).

✚

Search for Obligate Anaërobes in Respiratory Infections.—The probability of obligate anaërobes developing in the respiratory tract seems slight in view of the excessive air supply, and the findings indicate that such infections occurred, if at all, only infrequently in the case of respiratory disease presented for examination during the winter and spring season of 1920. There is nothing to show that the obligate anaërobic coccus found in one instance was pathogenic.—Ivan C. Hall, *Jour. Inf. Dis.,* 28, 127 (1921).

✚

Weiss's Reaction in Typhoid Fever.—Weiss's urochromogen reaction is of great value in the diagnosis of typhoid fever owing to its early appearance and simplicity. A specimen of the urine, filtered if necessary, is mixed with two to three parts of water and poured into two test tubes. Two or three drops of a 1 in 1,000 solution of potassium permanganate are then added to one test tube, and if the reaction is positive the urine assumes a bright canary yellow colour, in striking contrast with the urine in the other test tube. The reaction is not specific to typhoid fever, but may occur in advanced pulmonary tuberculosis and scarlet fever. This does not, however, detract from the diagnostic value of the reaction, as these diseases are not liable to be confounded with typhoid fever. Wiggelendam, *Nederl, Tijdschr. v. Geneesk.,* October 30, 1920; *Brit. Med. Jour.,* No. 3132, (1921).

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